THE UNITED REPUBLIC OF TANZANIA
MINISTRY OF EDUCATION, SCIENCE AND TECHNOLOGY
NATIONAL EXAMINATIONS COUNCIL OF TANZANIA

STANDARD TWO NATIONAL ASSESSMENT

Report on Reading, Arithmetic and Writing Assessment

Prepared by
The National Examinations Council of Tanzania
P. O. Box 2624
Dar es Salaam

April 2022

THE UNITED REPUBLIC OF TANZANIA
MINISTRY OF EDUCATION, SCIENCE AND TECHNOLOGY
THE NATIONAL EXAMINATIONS COUNCIL OF TANZANIA

STANDARD TWO NATIONAL ASSESSMENT

Report on Reading, Arithmetic and Writing Assessment

Prepared by
The National Examinations Council of Tanzania
P. O. Box 2624
Dar es Salaam

April, 2022

Acknowledgments

The Standard Two National Assessment for Reading, Arithmetic and Writing 2021 was successfully conducted. The National Examinations Council of Tanzania (NECTA) is grateful to all those who made this exercise successful.

To begin with, NECTA wishes to acknowledge the Ministry of Education Science and Technology (MoEST), the President's Office - Regional Administration and Local Governments (PO-RALG) and development partners who made the 3Rs assessment possible.

NECTA also extends its cordial thanks to all Regional and District Education Officers not only for their immediate response and collaboration in appointing supervisors and assessors but also for organising training venues in all the councils nation-wide. Special thanks also go to primary school teachers for their participation in supervising and rating the pupils who participated in the assessment despite the heavy rains and floods in some areas of the country during the training and administration of the assessment notwithstanding. NECTA would also like to acknowledge head teachers of all schools, which were sampled to take part in this assessment, the parents for their cooperation in making sure that their children did not miss the assessment despite the challenges triggered by the weather condition.

NECTA also wishes to extend its sincere thanks to its technical team for their tireless efforts in overseeing the whole process of the study that included preparing the assessment tools, training manuals and co-ordination of the training, monitoring and marking of the assessment, data analysis and interpretation and writing of this report.

Our sincere gratitude also goes to representatives from the Ministry of Education Science and Technology (MoEST) and its institutions particularly the Tanzania Institute of Education (TIE) and the technical team for preparing and overseeing the training and monitoring of the assessment.

Dr. Charles E. Msonde
EXECUTIVE SECRETARY

Table of Contents

List of Tables

List of Figures

List of Abbreviations

3Rs	Reading, Writing and Arithmetic
BRN	Big Results Now Project
BEST	Basic Education Statistics for Tanzania
BEMIS	Basic Education Management Information System
CWPM	Correct Words Per Minute
DAO	District Academic Officer
DEO	District Education Officer
DLR	Disbursement Linked Results
EGRA	Early Grade Reading Assessment
EGMA	Early Grade Mathematics Assessment
ESDP	Education Sector Development Plan
ESR	Education for Self-Reliance
EPfR	Education Program for Results
ETP	Education and Training Policy
FFBED	Fee Free Basic Education
FYDP	Five Year Development Plan
MoEST	Ministry of Education Science and Technology
NECTA	National Examinations Council of Tanzania
PO-RALG	Prime Minister's Office – Regional Administration and Local Government
PTR	Pupils-Teacher Ratio
PReM	Primary Record Manager
PSLE	Primary School Leaving Examination
ORF	Oral Reading Fluency
RC	Reading for Comprehension
REO	Regional Education Officer

SFNA   Standard Four National Assessment

SPSS   Statistical Package for the Social Sciences

STNA   Standard Two National Assessment

UNICEF   United Nations Children's Fund

USAID   United States Agency for International Development

Executive Summary

The main objective of the education sector is to enhance learning outcomes by improving Reading, Writing and Arithmetic (3Rs). The 2021 survey was conducted to determine the progress made in developing basic skills in the three R's (3Rs) Reading, Writing and Arithmetic. The survey is based on the baseline benchmarks established in the 2019 study that was conducted by NECTA following the directive by the Ministry of Education Science and Technology (MoEST). It also based on the Education Programme for Results (EPfR) indicators. The survey established a validated understanding of pupils' performance on the 3Rs across Tanzania.

The 2021 assessment of 3Rs adopted the methodology, which was also used in the 2019 assessment. The aim was to maintain compliance with the Education Programme for Results (EPfR) DLR 6.2 and 6.3 indicators. Hence, the assessment involved only public schools in all the 26 regions and 186 councils of Tanzania Mainland. Sampling was done randomly based on proportional representation. The population of interest comprised all the Standard II pupils attending public schools. The sample was selected to provide estimates of the pupils' performance at the national and regional levels with disaggregation by gender and locality.

Specifically, 524 schools were drawn from a sample frame of 12,675 (75.98%) public schools (287 rural, 237 urban) accounting for 28,364 pupils. Out of the 28,364 pupils, 14,425 were boys and 13,939 were girls. From this sample, 27,782 pupils participated in the survey[1] for both ORF and Oral Arithmetic.

The schools were randomly selected based on a one-stage sampling process. Each of the Standard II pupils in the schools sampled was assessed. The schools were stratified in terms of regions, resulting in 26 regions on Mainland Tanzania. In each region, the schools were further

---

[1] However, out of the 16,683 public schools, 1,323 (7.93%) schools with Standard II enrolments of fewer than 25 pupils and 2,685 (16.09%) schools with Standard II enrolments of more than 150 pupils were excluded. The schools with fewer than 25 pupils were excluded on the account of the costs associated with the assessment of a small group of pupils and those with more than 150 pupils were excluded to avoid a significant impact on the number of assessors needed to complete the exercise in a single day. Statistical analysis of various indicators was computed to determine whether the sub-sample accurately represented the excluded schools. Results indicate that the two groups were similar.

stratified to create urban and rural sub-strata. Within each sub-stratum, the schools were sorted based on the enrolment of Standard II pupils.

To ensure the validity of the data to be collected, training of trainers and assessors was conducted. The training involved 248 experienced examiners from NECTA and district councils as national trainers. Out of whom, 236 trainers who participated in the training were posted to all the 186 councils of Mainland Tanzania. The trainers then trained 3,576 assessors, who administered the assessment at the school level. Data collection at the council level in all the regions of Mainland Tanzania took place from 24th January 2022 to 25th January 2022.

Reading Skills Assessment Results

The main purpose of conducting the 2021 reading assessment was to determine the performance of pupils in two sub-tasks: Oral Reading Fluency (ORF) measured in the number of correct words per minute (CWPM), and Oral Reading Comprehension (RC) determined using the number of correct responses after the pupil had finished reading the comprehension passage. The results show that the mean scores for ORF improved by 1.31 percent from 26.18 in the 2019 3Rs study to 27.49 in the 2021 3Rs study. Further analysis on gender indicates that more girls' scored higher than boys in Oral Reading Fluency by acquiring the mean score of 29.46 CWPM as compared to the 25.43 CWPM attained by boys.

Moreover, in 2021, the target for pupils to attain the 80 percent benchmark in Reading for Comprehension (RC) was set at 41 percent. The results show that, 41.3 percent of the pupils in the 2021 study scored at the benchmark in RC compared to 38.7 percent in the 2019 study, which exceeded the target by 1.3 percent. The increase indicates improvement in RC, which implies that the number of pupils who can read and understand the text is steadily increasing.

Further analysis show that there is an improvement in the actual results for Kiswahili reading sub-tasks in zero scores. Although the target for 2021 was not reached, the percentage of pupils with zero scores dropped from 15.60 percent in 2019 to 14.5 percent in 2021. This indicates that the efforts made by the Government to improve the teaching and learning process have positive effects.

The findings also show progress when compared with the 2019 study. Specifically, the percentages of lower categories of readers (non-readers and beginning readers)[2] have decreased. The percentages of non-readers have decreased from 15.60 percent in 2019 to 14.50 percent in 2021. Analysis further indicates that the number of beginning readers has also declined in the two studies, consequently leading to an increase in the number of progressing readers from 42.70 percent in 2019 to 55.40 percent in 2021. However, the percentages of proficient readers dropped from 4.50 percent in 2019 to 3.40 percent in 2021. Further analysis by gender shows that girls outperformed boys across the categories.

When disaggregated by localities, the data shows that pupils from urban settings performed better than those from rural settings in both Oral Reading Fluency[3] and Reading for Comprehension[4]. Regarding the proportion of pupils who scored zero in reading subtasks, the results indicate that more pupils from rural schools scored zero on ORF (16.4%) and RC (26.4%) when compared to those from urban schools, which had 12.1 percent and 18.1 percent for the two tasks, respectively.

Moreover, the performance of pupils on the reading subtask was analysed by region. The results reveal that 7 regions (Dar es Salaam, Kilimanjaro, Njombe, Lindi, Arusha, Tabora and Tanga) that performed above the national average on ORF and RC registered a good performance even when the two sub-tasks were combined. It was also established that 8 regions (Katavi, Kigoma, Rukwa, Mara, Simiyu, Geita, Mwanza, and Singida) in both sub-tasks had extremely low mean score percentages of pupils who had performed at the set benchmarks. In ORF, Kagera had the highest improvement of 14.22 percent in 2021 compared to the 2019 study whereas Lindi registered the lowest improvement of 1.65 percent. In

---

2 The four categories of readers comprise non-readers (those who could not read a single word), beginning readers (those who could read at least 1 to 29 words), progressing readers (those who could read 30 words per minute and above) and proficient readers (able to read at least 45 words assigned and with 80% or higher in comprehension).

3 There is a statistically significant difference in the distribution of scores among boys and girls in ORF, x2(3, 1716503) =23676.360 p=.00. This means that girls outperformed boys in Oral Reading Fluency Subtask.

[4] More pupils from rural areas had statistically significantly more pupils scoring zero in Oral Reading for Comprehension. X2(1.1716401 =16980.01 p =.00as compared to urban pupils.

contrast, Morogoro had the highest decline of 12.06 percent whereas Dodoma registered a minor slump in improvement of 0.09 percent. In the RC sub-task, Kagera, Arusha, Songwe and Mwanza had an improvement of 7.37, 4.78, 4.15 and 1.03 percent, respectively. However, Morogoro and Simiyu recorded a decline of 15.89 and 14.97 percent, respectively.

Arithmetic Skills Assessment Results

The national benchmark for Arithmetic is set at 80 percent for Addition and Subtraction Level II and 60 percent for Missing Numbers. The annual targets for Addition and Subtraction Level II and Missing Numbers for 2021 were 19 and 41 percent, respectively. The results show that, the target was met in Addition and Subtraction Level II since 19.8 percent of pupils scored at the national benchmark. On the other hand, the target was not met for Missing numbers as only 22.7 percent of the pupils scored at the national benchmark.

Analysis to determine whether there were significant differences between boys and girls in terms of distribution of scores showed that for the Addition and Subtraction Level II sub-task there was a statistically significant difference in performance by categories and gender in Addition and Subtraction Level II, x2(3, 1646729) =373.974 p=.00. In other words, the girls' performance was more appealing than that of the boys in the Addition and Subtraction sub-task. Similar comparison was made in the Word Problems sub-task and revealed a similar trend. The results show *a* statistically significant difference in the distribution of scores in the Word Problems x2(3, 1646731) =521.144, p=.00. This means that the distribution of scores for girls was more appealing than that of boys.

Findings further indicate that 16.4 percent of the pupils scored zero in the Addition and Subtraction sub-tasks and 40.8 percent scored zero in the Missing Number sub-task. When compared to the 2019 study, the number of zero scores has been decreasing steadily in Addition and Subtraction. On the contrary, the percentage of zero scores in the Missing Numbers subtask has increased by 24.3 percent in 2021.

Additionally, four categories of performers (non-performers, emergent performers, approaching benchmark performers and benchmark

performers) were adopted[5]. The data analysed indicated that the performance of pupils in Arithmetic has been fluctuating for all categories of performers in 2019 and 2021. The percentage of pupils, who performed at national benchmark, decreased from 11.7 percent in 2019 to 9.2 percent in 2021. In the two years under review, the percentage of non-performers has increased from 35.4 percent in 2019 to 45.3 percent in 2021. On the other hand, it was noted that there was a decrease in the percentage of pupils in the approaching benchmark performers and benchmark performers categories in 2021. Moreover, a slight improvement was observed to be emerging among performers when the data were compared to 2019.

Data analysis was done to establish pupils' performance in each region. The performance of 13 regions was above the national mean score in Addition and Subtraction (Level II) when compared to 12 regions in 2019. The region with the highest proportion of pupils performing at the national mean score was Dar es Salaam, which had 43.4 percent. Rukwa had the lowest proportion of pupils performing at the national mean score (5.5%), although the region also recorded a slight improvement of 0.4 percent from 5.1 percent in 2019 to 5.5 percent in 2021.

Regions were ranked according to their performance in all the three Arithmetic sub-tasks. Data indicate that Dar es Salaam ranked top in all the three Arithmetic subtasks. However, Simiyu ranked bottom in the Addition and Subtraction sub-task whereas Kigoma ranked bottom in the Missing Numbers and Word Problems.

Writing Skills Assessment Results

The Writing Skills assessment tested the ability of the pupils to write words correctly, to capitalise given words written in small letters and to copy and punctuate a given passage.

---

[5] Non-performers: The score for the Missing Number Sub-task equals zero and/or the score on the Addition and Subtraction (Level II) sub-task equals zero. Emergent Performers: Both scores for the Missing Number sub-task and the Addition and Subtraction (Level II) sub-tasks are above zero. Approaching Benchmark Performers: Either the score on the Missing Number Sub-task or the score on the Addition and Subtraction (Level II) sub-task is at or above the Tanzania benchmark. Benchmark Performers: Both scores for the Missing Number sub-task or the Addition and Subtraction (Level II) subtasks are at or above the Tanzania benchmark.

Data indicates that pupils performed better in writing words than in the other two sub-tasks when considering the overall national mean scores for each sub-task. The national mean score in writing words was 51.99 percent. This indicates that pupils managed to write at most 5 words out of 10 words. In changing words written in small to capital letters, the mean score was 28.26 percent. Data shows that pupils capitalised on 3 out of 10 given words. Further analysis indicates that, in re-writing a passage and using appropriate punctuation marks, the mean scores was 32.61 percent. This data shows that pupils copied correctly at most 6 words out of the 16 words forming the passage and used appropriate punctuation marks. The analysis based on gender further shows that girls performed better[6] than boys in all the three writing sub-tasks.

Further analysis to determine the performance of pupils at regional level on Writing Skills shows that 13 regions performed above the national mean percentage scores (39.5%). Dar es Salaam had the highest proportion of the pupils performing at the national mean scores (39.5%) whereas Simiyu had the lowest proportion (24.1%). The analysis was also done to compare the performance of pupils based on gender. The results show that girls outperformed boys in Writing Skills in all the regions except in Katavi where boys had better performance than girls.

Analysis of Item Difficulty

The item difficulty analysis was done to establish the extent to which pupils performed in each Reading sub-tasks. The analysis of performance of pupils on ORF was done to establish the percentages of the correct reading of each word. The results show that many pupils found it difficult to read the word *Ng'alo*. This was exemplified by the lower percentage (31.6%) of pupils who managed to read it. The word was difficult to pronounce because it is composed of a nasal sound syllable *Ng'a*. Most of the pupils also failed to pronounce the word *Subira* correctly. They pronounced it

---

[6] The study found that girls had statistically significant better mean percentage scores in the Writing Words sub-task (54.70 ± 33.06) than boys (49.10 ± 34.94), t(1731644)=108.511, p=0.00, changing small letters into capital letters (30.35 ± 38.41) compared to boys (26.03 ± 36.63), t(1731644)=75.520, p=0.00 and re-writing a passage using appropriate punctuation (35.03 ± 38.07) compared to boys (30.02 ± 36.40), t(1731644)=88.349, p=0.00.

incorrectly as *Subila.* This difficulty can be associated with the mother-tongue effects. Data further reveals that pupils had difficulties in pronouncing words that were composed of consonant clusters such as *amecho<u>mwa</u>, alishi<u>ndwa</u>, wali<u>mpe</u>leka* and *ho<u>spi</u>tali*. Further analysis indicates that the percentages of the correct words read decreased towards the end of the passage. This implies that most of the pupils were not fluent enough to read all the words in the passage within one minute.

The RC sub-task consisted of five questions: Four factual and one inferential. The findings indicate that the first question was less difficult to the pupils than the second and the fourth question. The two questions seemed difficult for the pupils since most of the pupils (63.3% and 61.8% respectively) were unable to respond correctly to those questions. The data analysis indicates that the three questions that required them to recall names were easier than the two questions that required them to recall information.

The oral arithmetic sub-task consisted of 10 questions (five Addition and five Subtraction). The items were set in a way that the level of complexity increased gradually from the first question to the last one. The findings indicated a similar trend to the findings of the 2019 study whereby the pupils' performance decreased with increasing levels of complexity.

In addition items, pupils faced difficulty in adding two double-digit numbers involving carrying as assessed in items 4 and 5. In subtraction, the pupils found it more difficult to subtract numbers that involved borrowing as assessed in items 9 and 10. Generally, subtraction was found to be more difficult for pupils than addition as the percentages of pupils who gave correct responses on subtraction items were lower than those on addition items.

For Missing Numbers, the results show that there was a reduction of the percentage of correct responses as the level of complexity increased. The percentage decreased more in items, which required pupils to increase by 2, decrease by 2 and increase by 5 than in those which required them to increase or decrease by 1. This exhibited the same pattern as the finding of the 2019 study.

In Writing Skills, the analysis of item difficulty was done in all the three Writing subtasks. The results show that in the Writing words sub-task, more

pupils (77.4%) and (66.8%), respectively, experienced difficulties to write the two words *baiskeli* and *pundamilia than* the other words. The word *chanuo* was also relatively difficult to 58.3 percent of the pupils. These words had one thing in common, that is, they consisted of consonant cluster as underlined in the three words *bai<u>sk</u>eli, pu<u>nd</u>amilia and <u>ch</u>anuo*. Generally, the performance of pupils in Writing Skills was average as most of them correctly wrote at most 6 words out of 10. Further analysis on the second sub-task involving capitalising words shows that there was no significant difference among the 10 words. The pupils' performance ranged from 23.2 to 35.8 percent.

In the third sub-task, pupils were required to rewrite a passage and use punctuation marks. It was further noted that, pupils were able to rewrite the given words in the passage but experienced difficulties in using appropriate punctuation marks. The results showed that, only 7.7 percent of pupils used the full-stop correctly; 9.3 percent used exclamation mark; 11.4 percent used the comma; and 12.1 percent used the question mark correctly. This performance indicates pupils' inadequate competencies in using the basic punctuation marks.

Availability of Teaching and Learning Resources

Data relating to teaching and learning resources for the 3Rs was collected from Head Teachers using questionnaires.

The collected data shows that there is good supply of textbooks for teaching Arithmetic Skills by 84.20 percent. The supply of supplementary books was by 73.85 percent. Moreover, the data collected on tools such as counting aids for teaching Arithmetic Skills revealed that such tools as counting aids for teaching Arithmetic Skills accounted for 84.87 percent.

Data indicates further that the supply of textbooks for teaching Reading Skills was good in the schools at 81.65 percent. Further analysis shows that the presence of reading books such as short story books for teaching Reading Skills was good at 86.31 percent.

Teaching and Learning Environments

During data collection, heads of school were asked about the general teaching and learning environment including the availability of desks, tables

and chairs for pupils and teachers, classrooms and drinking water and sanitation.

The data indicates that, generally, the availability of desks, tables and chairs for pupils and teachers was good at 82.08 percent. Moreover, there was adequate availability of classrooms relative to the number of pupils in standards I and II stood at 72.91 percent. Regarding the availability of water sources for the pupils to drink and sanitation, 34.85 percent of the respondents acknowledged that there was good supply of water whereas 28.66 percent said it was average. The respondents, who said the supply was very good represented 9.12 percent. On the other hand, 19.54 percent confirmed that the availability of water sources and sanitation was poor in schools.

As for the factors that affect the teaching and learning of 3Rs, shortage of 3Rs teachers emerged as the major challenge that affected the teaching and learning of 3Rs in schools. Heads of schools identified the shortage of teaching and learning materials as the second problem that faced the field, with the walking distance from home to school featuring as the third barrier to the teaching and learning of 3Rs. The findings show that unsatisfactory school attendance emerged as the fourth challenge primarily because the number of pupils missing lessons was big. The fifth hindrance to teaching and learning of 3Rs was receiving pupils with poor 3Rs skills transferred from other schools.

Conclusion and Recommendations

Conclusion

Generally, the objectives of the 2021 3Rs study were fully achieved. When compared to the 2019 3Rs study, the findings depict progress in all the three skills. They also portray some persistent trends, which may require pedagogical interventions. The overall performance signifies that the pupils' performance was relatively low in Writing Skills assessment as compared to Reading Skills and Arithmetic Assessment results.

As far as Reading Skills assessment is concerned, the findings indicate a decreasing trend in the lower groups in the categories of readers (non-readers and beginning readers) and a shift towards progressing readers. These trends indicate that the efforts made to improve teaching and learning of the reading skills is steadily improving. Similarly, trends in

Arithmetic Skills assessment indicate improvements in Addition and Subtraction Level II and Word Problems but detected a decrease in performance on Missing Numbers.

The percentage of pupils scoring at the national benchmark is steadily increasing. The proportion of pupils scoring zero is also decreasing. However, there are pedagogical issues, which need to be addressed particularly the pupils' ability to handle Addition and Subtraction level II. The issue of pupils struggling to handle addition and subtraction items, which require carrying and borrowing is still recurring. On the contrary, even though progress is detected in Reading and Arithmetic Skills, the results indicate a decline in the performance of pupils in writing skills when compared to the 2019 3Rs assessment. Moreover, in Writing Skills, the findings show some persistent issues, which have pedagogical implications. Like the findings in the 2019 study, pupils find it difficult to use punctuation marks appropriately. It was also noted that pupils still cannot clearly differentiate capital letters from small letters.

As far as gender is concerned in relation to learning, the study found signs of gender imbalance beginning to emerge, and this requires further investigation to determine the reasons for its emergence for the purpose of devising measures to alleviate it. The results in all 3Rs skills revealed that girls performed significantly better than boys. The differences in all the three skills were statistically significant.

The analysis of data based on locality also indicated that urgent measures need to continue to be taken because the study shows variations in performance between rural and urban based pupils. Specifically, pupils from urban areas performed better in all the three skills when compared to pupils from rural-based schools.

Recommendations

Based on the findings of this study, the following recommendations are suggested:

(i)   It has been established that reading develops from as low as sound association with the alphabet of the language to as complex as reading words, phrases and sentences. All these skills, however, develop with frequent exposure to the text. It is, therefore, important

to improve the ability of pupils to read and use reading to learn by ensuring frequent exposure to the level appropriate text. Pupils should be guided to read short stories appropriate to their level.

(ii)   As far as gender is concerned, both studies show that the girls performed significantly better than boys. The normal trend, which was evident earlier, is for girls doing better in reading and writing skills and boys doing better in Arithmetic skills. Since the purpose of the nation is to eliminate gender imbalance, there is a need for respective authorities to investigate why girls outperform boys, a situation that will further bring gender disparity in future.

(iii)   The study also found that locality matters in terms of pupils' performance in the three skills. Pupils from urban-based schools were more likely to perform better than those from rural areas. Since the nation encourages equality in all settings, it is recommended that the reasons for this trend be investigated and well addressed so that the performance is not affected by localities.

(iv)   The study also established recurrent issues in all the three skills. One of the issues is the failure of many pupils to read words with nasal sounds and words with consonant clusters. In Arithmetic, findings indicate relatively poor performance of pupils in Addition and Subtraction level II items, particularly items requiring carrying in addition and those requiring borrowing in subtraction. In Writing, the use of punctuations and recognition of small and capital letters were found to challenge pupils in this study as it was the case in the 2019 study. This situation signals pedagogical deficiencies, which affect effective teaching of these skills. Therefore, it is recommended that authorities such as school quality assurers and experts in this area investigate how these skills are taught and suggest ways to enhance pupils' performance.

CHAPTER ONE
CONTEXT AND OVERVIEW OF 3Rs ASSESSMENT

1.1 Introduction

This chapter briefly highlights the rationale for the 3Rs assessment in relation to the Tanzania education policy. It begins by briefly elaborating on the structure of Primary Education in Tanzania and, hence, the need for the Reading, Writing and Arithmetic (3Rs) assessment. Then, the chapter presents the background to the 3Rs assessment and provides an overview of the 3Rs assessment to understand the importance of assessing these skills at the standard II level.

1.2 Education Policy Context

The provision of education in Tanzania is one of the priorities for human capital development, which is key to economic and social development. The education and training policy specifies this role of the education sector in alignment with the priorities of the country as stipulated in the Five-Year Development Programme (FYDP 2021/22 – 2025/26). The FYDP and the education policy provide indicators related to education such as universalising ordinary level of secondary education and providing alternative education by improving vocational and training education, in addition to fostering skill development and youth empowerment. To achieve these aims, the government of Tanzania is implementing the Education Sector Development Plan (ESDP) to ensure improved learning outcomes and skill acquisition.

1.3 Primary Education in Tanzania

The primary education in Tanzania is organised based on the philosophy of Education for Self-Reliance (ESR). The philosophy emphasises integration of theory and practice, enhancing critical thinking and inquiry, nurturing confidence and valuing humanity. Primary education in Tanzania was established by Act No. 25 of 1978 and its amendment of cap 353 of 2002. The Act stipulates that primary education is compulsory and the right of all school going age children. The act further states the duration for enrolled pupils to

spend while pursuing primary education, whose duration is seven years which is preceded by one year of pre-primary learning.

The assessment of 3Rs is related to curriculum reforms which occurred in 2015. The major change in this reform was the shift from the subject-oriented curriculum, which was characterised by mastery of content, to competency-based curriculum, which emphasises acquisition of competencies. The competency-based curriculum consequently replaced the subjects, which were taught in standard I and II with Reading, Writing and Arithmetic whose emphasis is on the mastery of these essential competencies. Curriculum reviews reflect the requirements of the education and Training Policy of both 1995 and 2014, the Education Sector Development Plan 2007/2008 – 2016/2017 and the Tanzania Development Vision 2025. The acquisition of the 3Rs is a necessary step in the development of skills that are necessary for the pupils subsequently to embark on more challenging studies. Hence, the assessment of 3Rs skills is key to improving both the teaching and learning of literacy and numeracy, and acquisition of knowledge and skills in general.

The 2015 Primary Education Curriculum is organised in two parts. The first part covers Standard I to Standard II. This component focuses on development of pupils' Reading, Writing and Arithmetic skills. It is also designed to enable pupils to acquire the required fluency, which enhances their learning at higher stages of their learning. The second segment covers the Standard III to Standard VII curriculum. This part is further divided into two sections: The Standard III and IV, and the Standard V to VII. The standard III and IV part can be categorised as advanced 3Rs level. The pupils at this level are expected to further sharpen their 3Rs competencies while acquiring lifelong learning skills. The standard V to VII curriculum aims to develop competencies, which are essential in daily life through studying different subjects.

Seven principal subjects are taught in the primary school curriculum (from standard III to VII). The subjects are Kiswahili, English Language, Social Studies, Mathematics, Science and Technology, Civic and Moral Education, and Vocational Skills. Subsidiary and optional subjects include Religion, French, and Arabic. Pupils are

required to learn all the principal subjects and acquire all the essential competencies as required.

1.4 Background to 3Rs Assessment

The first 3Rs survey, which had adhered to the internationally recognised methodology, was conducted jointly by the Government of Tanzania and its development partners in 2013. The survey was carried out in response to the demands of the Big Results Now Project (BRN). This survey was followed by the second survey, which took place in 2016. The two surveys adopted the EGRA, EGMA methodology. In 2019, another survey was conducted by NECTA following the directive by the Ministry of Education Science and Technology (MoEST) for the Council to conduct the assessment. The survey did not wholly adopt the EGRA methodology. However, the Education Programme for Results (EPfR) indicators were treated in a way that was fully compatible and comparable with the 2019 assessment. The differences in methodology considered the fulfilment of the EPfR requirement and NECTA obligations as the sole curriculum assessor in the country.

According to the 2014 Education and Training Policy, basic education in Tanzania Mainland has been extended from the former seven years to the ordinary secondary school level. The implication of this extension is that the pupil who is enrolled in Standard I is expected to study uninterruptedly up to the conclusion of the prescribed basic education at ordinary level secondary school (Form IV), a terminal stage for those not proceeding to the advanced level. Although the policy provides this opportunity, it does not imply that the promotion of pupils from lower to higher level is a straight forward path. After all, the quality of education provided to the pupils must be guaranteed, hence the need for national assessments.

The national assessments, which are conducted in primary education, are expected to provide feedback on the quality of curriculum delivery. These assessments provide feedback on the readiness of the pupils to progress to higher levels and, particularly, in ascertaining the quality of skills they acquire to support higher level learning requirements. There are two national assessments that are conducted by NECTA in primary education: The Standard

Two National Assessment (STNA) and the Standard Four National Assessment (SFNA).

The STNA is conducted using a sampling methodology. The assessment aims to assess the extent of the pupils' achievement in the acquisition of the 3Rs. The acquisition of these skills is essential since they are basic building blocks for pupils to subsequently learn effectively at higher education levels. The successes and challenges of learning, which are identified during the assessment are communicated to teachers and other stakeholders in education for the purpose of improving reading, writing and arithmetic skills at that level. The goal is to ensure that improvements in 3Rs skills at that level will facilitate pupils' effective learning in higher levels and, hence, fulfil the requirements of the Education and Training Policy of ensuring that pupils enrol in standard I and exit in ordinary level secondary school successfully and uninterruptedly.

The SFNA serves two purposes. First, as a criterion for promotion of pupils to the next level (standard V to VII). Second, as a measure of the pupils' readiness to embark on the learning of more complex competencies. The SFNA also assesses the extent to which the pupils have developed the 3Rs and how they can apply them in learning other content areas. The analysis of the results of the assessment reveals both successes and challenges. Hopefully, appropriate interventions that are implemented can minimise the challenges identified and enhance efficiency in learning. This practice, consequently, ensures the progression of pupils to higher level in line with the requirement of the 2014 Education and Training Policy without necessarily compromising the quality of the education.

The 2021 assessment of 3Rs adopted the methodology, which was used in the 2019 assessment. The aim was to maintain compliance with the Education Programme for Results (EPfR) DLR 6.2 and 6.3 indicators. Hence, the assessment involved only public schools in all the regions and districts on Tanzania Mainland. Sampling was done randomly based on proportional representation.

1.5 Overview of Reading Skills

The Rationale for Assessing Reading Skills

The basic definition of literacy is the ability for an individual to read, write and perform basic arithmetic. Reading is particularly the key to learning information, which is coded in some form of symbols known as writing. Reading is so central to learning other skills in that without the ability to read, learning of other knowledge from written texts becomes difficult, if not impossible. Although there are three skills, which lead to affirming a person's literacy, reading holds a central role as it is the basis for learning and acquiring other skills. Indeed, it lays the foundation for independent learning. Literacy (reading included) influences the society's culture. Shoham et,al (2011) found that the less separation there is between men and women in a nation's culture the larger the proportion of people in the country who know how to read and write. This finding shows the importance of literacy. In other words, the less the people who do not have the 3Rs, the less the gender disparity in a nation.

In the academic arena, studies affirm that reading fluency has a positive correlation with prediction of the pupil's achievement. For example, Alvarez-Canizo et al (2015), Bigozzi et al (2017), and Nunes et al (2012), as quoted in NECTA (2019), associate reading fluency with the prediction of pupil's performance. Moreover, reading fluency correlates with good comprehension (Elhassan, Z. et al, 2015). In other words, an individual who can read accurately and fluently possesses higher comprehension abilities. Essentially, knowing how to read is especially crucial in today's world due to the availability of huge amount of information. This capability requires well-developed reading skills to enable the person to read and understand information from a large quantity of texts within a short time. Hence, assessing this skill at early stages of the pupils' education is vital.

Focus of the Reading Assessment

The focus of the reading assessment is guided by the stages in which learners go through as they learn how to read texts. There are many stages which are necessary for pupils to learn how to read. Significantly, however, most scholars (see, for example, Roskos et al 2009) agree that the first stage for an individual to learn to read is

learning and understanding the language orally. Pupils first learn the sounds of the language before they learn the alphabets of that language. In other words, the sounds of the alphabets of a language are based on oral language, which the pupils first learn. However, assessing the pupils' ability to read, it is important to consider the later stages, which include reading syllables, words, sentences and paragraphs. The assumption is that pupils pick up the other stages while learning the language at home because even when pupils learn a new language, the mother-tongue (the language they first learned) forms the basis for learning. The focus of reading assessment will, therefore, be the final expected results of learning, that is, reading fluency and reading for comprehension. Chambers (1997) describes fluency as a smooth and effortless production of speech and punctuation. Assessing fluency requires the use of timed assessments of correct words per minute due to its strong correlation with more complex assessments, as Goves and Wetterberg (2011) argue.

For pupils to learn how to read in a particular language, they must learn letter sounds, decoding, fluency and reading for comprehension. The focus of this assessment is the last two skills, namely reading fluency and reading for comprehension because letter sounds and decoding are lower order reading skills whereas comprehension is a higher order skill in terms of categorisation. Reading for comprehension is the eventual goal of learning reading, hence the focus on assessing this skill. Being able to read is important but being able to read and decode the message imbedded in the print is the goal. Reading for comprehension is a key for pupils to use as a tool for learning new knowledge from written texts, which is widely used at higher stages of their studies. The assessment focuses on the higher order skills because assessing these skills also covers the lower order skills, which are a subset of higher order skills.

Reading Skill Tool

The tool for assessing the reading skill which was developed during the 2019 assessment by the National Examinations Council of Tanzania in collaboration with appointed Standard I and Standard II teachers was adapted. The administration of the tool employed the

same procedures, which were used during the 2019 assessment. The tool consisted of two sub-tasks as shown in Table 1:

Table 1: Reading Assessment tool Sub-tasks

Subtask	Skill	Description The child is asked to:
Oral Reading Fluency	This task required pupils to read automatically rapidly and correctly.	Read aloud a grade-level passage printed on a page (timed sub-task)
Reading Comprehension	Comprehension	Read aloud a grade-level passage and verbally respond to five oral questions (four literal and one inferential) that the assessor asks about the short passage (Untimed sub-task)

1.6   Overview of Arithmetic Skills

Rationale for Assessing Arithmetic Skills

Learning of arithmetic skills is fundamental as it provides a person with numeracy literacy, which is necessary in everyday life. In most of the human activities some form of arithmetic knowledge is required. The goal of teaching arithmetic skills and mathematics in general is to enable pupils to use mathematical skills in analysing and solving practical problems (Mazana et al, 2020). Studies have also shown evidence for early grade mathematical knowledge having a predictive relationship to academic achievement in later grades (Memisevic et al, 2018; Siegler et al, 2012). The importance of mathematics in solving practical issues is evident in many areas of human activity. Hence, apart from the use of mathematical knowledge as a predictor of performance in later learning achievement, mathematical knowledge is so prevalent in our lives that it is a key skill requiring early assessment while learning. Thus, the purpose of assessing arithmetic skills is to identify areas where pupils face difficulties in learning mathematical concepts and develop interventions for making necessary improvements.

Early grade arithmetic assessment is also important since it can help to monitor system level changes and, hence, can serve as a tool for

programme evaluation. This makes this assessment important for policy-makers as it enables them to evaluate the implementation of the curriculum. As pointed out earlier, mathematical knowledge serves as a tool for analysis. It can also act as a method for improving thinking skills. This makes a good basis for assessing this skill at early grade levels.

Focus of Arithmetic Skill Assessment

To maintain comparability of this study with the previous one, the same sub-tasks were used to form the assessment tool. The tasks can generally be classified in three categories: Number recognition tasks, operations on number and problem-solving tasks. The first category consisted of missing numbers in patterns, which aimed to assess the ability of pupils to recognise the nature of the arrangement of the number to determine the missing ones. The second sub-task was primarily designed to assess the ability of pupils to perform operations on numbers, particularly addition and subtraction. Under this subtask, the addition and subtraction level II items were used. The last sub-task was designed to assess the pupils' ability to use operations on number in solving real-life problems using Word Problems.

The administration of the assessment tool also adhered to all the procedures which were applicable during the 2019 3Rs assessment. This was done to maintain comparability between the 2021 3Rs study and the previous studies for 2016 and 2019. Addition and subtraction level II sub-tasks were administered orally alongside oral reading skills to address the requirement of EPfR DLR 6.2 and 6.3. Missing Numbers and Word Problems sub-tasks were done using the paper and pencil strategy. The arrangement of the sub-tasks in the tool followed the same order, with oral reading assessed first and followed later by assessment of oral arithmetic skills at one sitting.

Arithmetic Skill Tool

To develop the arithmetic assessment tool, experienced Standard I and Standard II teachers were assigned the task of setting several items for assessing the pupils. These set items were developed into a tool by the examinations officers responsible for arithmetic skills assessment. Several sets of equivalent assessment tools were

developed. These tools were then checked and verified by technical experts and agreed upon for administering. The guiding principles, which were followed during the setting of the items for use in developing the assessment tool included adherence of the tool to the national curriculum and maintaining comparability of items to meet the requirements of the DLR 6.2 and 6.3 indicators. During the preparation of the tools in 2019, consensus was that there was no need for an equating study for the arithmetic assessment items as they closely matched with the type of items that were used in the 2016 survey. The sub-tasks, which were used during the 2019 assessment remained unchanged as Table 2 illustrates.

Table 2: **Arithmetic Assessment Tool Sub-tasks**

Subtask	Skill	Description The child was asked to …
Missing Numbers (Number patterns)	This sub-task required the ability to discern and complete number patterns.	fill in the blank space the missing number in a pattern of four to six numbers (timed sub-task).
Addition and Subtraction Level II	This sub-task required the ability to use and apply procedural addition and subtraction knowledge to solve more complex addition and subtraction problems.	solve the addition and subtraction given. In this subtask the pupil was allowed to use any strategy they wanted, including paper and pencil to calculate and give their solutions orally. However, the assessor could advise the pupil to use another strategy if he/she felt that the strategy which the pupil was using was inappropriate at his/her level. If the pupil was not familiar with another strategy, the assessor advised him/her to continue to another item (untimed subtask).
Word Problems	This sub-task required the ability to interpret situations given in the form of a problem and create a mathematical plan to solve it.	solve addition and subtraction problems. The pupil was allowed to use paper and pencil to make their plan in solving the problem. The subtask assessed their ability to interpret presented problems and use the knowledge of addition and subtraction in planning to solve them (timed sub-task).

To determine the cognitive level on which pupils operate while solving Addition and Subtraction Level II items, the methods they

used to attempt the items were sought. The tool contained a section requiring the assessors to identify the strategies that each pupil used among the following: Use of paper and pencil, tallying, use of counting devices including counting of fingers.

1.7   Overview of Writing Skills

Rationale for Assessing Writing Skills

Humanity has over time transformed spoken languages into systems of symbols in the form of writing. Writing is one of the chief means of communication for storing and sharing information. This communicative function makes writing vital to learn because it constitutes one of the indicators of a person's literacy. In verbal communication, both the speaker and listener are active as the listener can ask questions for clarification. In communication through writing, on the other hand, the flow of information is usually unidirectional. Until the reader writes back and the writer replies, the communication remains incomplete. As such, there is a need for writers to write concisely and clearly if their message was to be transmitted exactly as they wished. The reason is that the chances for the reader to ask for clarification are rare and can take a long time.

Literature on writing points out three aspects of competencies, which are foundational stages for writing: Notational competence, orthographic competence, and the morphological aspect of writing. Scholars such as Pinto, Bigozzi, Gamannossi and Vezzani (2012) explain that notational competence strongly predicts the early acquisition of writing skills. They also stress that phonographic awareness of language enhances the acquisition of orthographic competence before the morphological aspect. In other words, writing is best supported by pupils' awareness of the oral language competencies, which then allows them to associate with the phonological aspect before they can relate it morphologically (McCutchen et al, 2009).

Focus of the Writing Skills Assessment

The assessment of Writing skills focused on the ability of the pupils to use the Kiswahili alphabet to form words and whether they can

use simple punctuations in communicating ideas. Activities were designed to prompt them to write. Such activities included their associating objects with corresponding names (words) that the pupils were expected to write using correct spellings. The assessment also assessed the children's textual competence. In this case, the pupils received tasks such as capitalising words written in small letters and rewriting a paragraph using appropriate punctuations.

Writing Skills Tool

Like for other skills, experienced teachers particularly those for Standard I and Standard II teachers developed the items for the Writing assessment tool. The items they prepared were moderated to ascertain their adherence to the curriculum and writing syllabus. Several sets of equivalent difficulty were developed and moderated by NECTA co-ordinators in collaboration with EPfR technical teams. The suggestions made by the EPfR and other stakeholders were incorporated to modify the tool accordingly and ensure that the items effectively assessed what they were intended to assess. The tool consisted of three sub-tasks similar to those applied in the 2019 3Rs assessment. The first two sub-tasks assessed children's orthographic knowledge and the third sub-task evaluated their textual competencies. Table 3 shows the sub-tasks, which made up the assessment Tool.

Table 3: **Writing Assessment Tool Sub-tasks**

Subtask	Skill	Description The child was asked to…
Writing single words representing given pictures	This sub-task required children's knowledge of Kiswahili orthography especially how syllables are used in forming words.	look at pictures of common objects and write the names (words) they represent.
Identification of Small and Capital letters	This sub-task required the knowledge of the alphabet forming Kiswahili orthography especially how small letters differ from capital letters.	identify and underline the words written in capital letters from a list of words which had a combination of words written both in capital and small letters.
Appropriate use of punctuation marks	This sub-task required the knowledge of children of the	re-write the given passage while putting appropriate

11

Subtask	Skill	Description The child was asked to…
in writing.	mechanism of writing in Kiswahili language particularly the use of basic punctuation marks in writing.	punctuation to make the passage to flow naturally and logically.

CHAPTER TWO
METHODOLOGY

2.1 Introduction

This chapter presents the methodology, which was used during the survey. Specifically, the chapter describes the population of the study; the sampling techniques, procedure and criteria used; the sample size and its rationale; the replacement criteria of the schools sampled applied where necessary; and the calculation of the sample size. The chapter also highlights the verification process of the schools sampled and the final sample count. It also explains the marking process, data capturing methods, and related processes such as data cleaning, data weighting and data analysis. The chapter further elaborates on the pre-data collection processes. Such processes include the appointment of trainers and the training of assessors. The chapter, finally, explains the limitation of the survey.

2.2 Population

All the Standard II pupils in 2021 in Tanzania Mainland were targeted. The sample was selected to provide estimates of pupils' performance at the national and regional levels with disaggregation by gender and urban/rural levels. The sample frame was obtained using the Primary Records Manager (PReM) computer system, which manages the data for these schools on Tanzania mainland. The system serves as the most complete and accurate source of school data available at NECTA[7]. The population consisted of 16,683 public schools out of which, 1,323 (7.93%) schools with a Standard II enrolment of fewer than 25 pupils and 3,685 (16.09%) schools with more than 150 Standard II enrolment of pupils were excluded. The schools with the enrolment of fewer than 25 Standard II pupils were excluded to avoid assessing a small group of pupils. Likewise, schools with the enrolment of more than 150 pupils were excluded to avoid a

---

[7] The PReM system manages data electronically for all pupils in Tanzania's primary schools from Standard I to Standard VII. Enrolment data includes pupils' names, date of birth, distance from home to school, parents' or guardian's addresses and other particulars. The PReM and the Basic Education Management Information System (BEMIS) are complementary. For example, whereas BEMIS provides summary data of enrolment in a particular school, PReM yields detailed data and other information such as an individual child's assessment progress and transfers.

significant impact on the number of assessors needed to complete the assessment within the allocated time.

Based on these specified limits, schools were selected and sorted by district, localities, enrolment and school code. The rationale for sorting the schools by localities and enrolment was to ensure that the schools sampled represented the population of pupils in the respective regions. Moreover, the ratio of the contribution of pupils enrolled in each council was computed to determine the number of schools to be sampled from the respective district council. To ensure compliance with DRL 6.2 and 6.3, the sampling procedures, which were used in the 2019 study were adopted. The 2019 study used a methodology, which was fully compatible with the EPfR indicators on mean reading speed in correct word per minute and Addition and Subtraction level II. Thus, each council was expected to contribute at least 2 schools but not more than 5 schools.

To ensure the sampled schools represented all the portions of the population in the region, the council with a higher ratio was given more weight in the sampling criteria. After making appropriate exclusion, the reservoir sampling technique was performed using a computer system. Accordingly, a sample of 524 schools was drawn from the sample frame of 12,675 (75.98%) public schools. Among the 524 selected schools, 287 were in rural and 237 in urban areas. Table 4 illustrates this sampling.

Table 4: **Sample Methodology Summary**

Stage Number	Item Sampled	Stratified by	Probability of Selection
1 Schools	Schools (524)[8]	Region (26) Councils (186) 20 Schools per region	Proportional to Enrolment (Class Size)
2 Classrooms	Standard II Classrooms	<none> All Standard II streams per selected schools were included	Non-Probability Sampling (Purposive)

---

[8] Note that NECTA's sample was 524 schools instead of 520 schools as stipulated in the sample methodology summary because Tanga Region, with 12 councils contributed 24 schools instead 20 to the sample since the sampling criteria required every council should have at least 2 schools. Thus, the additional 4 schools raises the sum of main sample to 524 schools.

Stage Number	Item Sampled	Stratified by	Probability of Selection
3 Pupils	Standard II pupils (Almost 28,816 pupils)	<none>	Non-Probability Sampling (Purposive)

Ultimately, 524 public primary schools participated in the assessment. Statistical analysis of various indicators to determine whether the purposive exclusion of schools had any bias and whether the sub-sample was an accurate representation of the population was computed. The statistical analysis that was conducted to determine the relationship between the sampled and non-sampled schools showed insignificant differences between the performance of sampled and non-sampled schools in both the PSLE 2021 and SFNA 2021.

2.3 Sampling Criteria

The schools were randomly selected based on a one stage sampling process. Each of the Standard II pupils in the sampled schools was assessed. The schools were stratified by region, which resulted in 26 regions in Tanzania Mainland. Within each region, the schools were further stratified by council to create sub-strata for urban and rural localities. Then the schools were sorted based on the enrolment of Standard II pupils within each sub-stratum. Thus, there was a minimum of 20 schools per region, as well as a minimum of 2 and a maximum of 5 schools per council. The resulting sampled schools were selected using probability sampling proportional to the enrolment of Standard II pupils within each region, and the actual number of schools per council, which had to be proportionate to the contribution of the Standard II pupils in the council to the region. The requirements for a school to participate in the 2021 3Rs assessment were as follows:

(a) Public or government school with a Standard II enrolment

(b) Enrolment ranging between 25 and 150 pupils.

(c) Availability of pupils and readiness to take part in data collection at the specified time.

(d) Being in an appropriate region and selected district.

2.4   Replacement Criteria

Out of the 524 selected schools for the study, 3 (0.57%) schools could not be easily reached or were excluded due to various reasons as indicated in Table 5.

Table 5: **Reasons for School Replacement**

	Reason(s)	No. of Schools
1	Changed into English-medium school	1
2	Registered as school for Special Needs pupils	1
3	Difficult to reach	1
	Total	**3**

However, to maintain the probability proportionate of the sampled schools to the regional enrolment contribution, the replacement criteria for the three (3) schools were as follows:

(a)   The nearby school was selected from a stratified list.

(b)   The replacement school did not exceed the enrolment of pupils of the school to be replaced by ±10%.

Data revealed that the 3 schools met the replacement criteria.[9]

2.5   Calculating Sample Size and Rationale

The sample was designed to be robust and sufficient to generalise findings at the regional and national levels like that of the 2019 3Rs assessment. Besides, the study computed power calculations to determine whether the sample was an accurate representation of the population. Nonetheless, it was not biased due to the exclusion of schools with less than 25 pupils and more than 150 pupils. Based on

---

[9] Mean enrolment in Standard III of the 4 sampled schools was 83.5 whereas that of the replacement schools was 63.0. The study accepted H0 hypothesis of no difference in enrolment between the sampled and the replacement schools ($U = 7.0, p = 0.886$ – *two tail at α = 0.05*). It can be concluded that the difference between replaced and sampled schools was statistically insignificant.

the null hypothesis (H0) that there is no difference between the sampled and non-sampled schools, a t-test showed a significant difference between the sampled and non-sampled schools due to class size. However, to determine whether the effect existed from excluding the non-sampled schools, the computation of the power statistic revealed that the probability of correctly rejecting the null hypothesis was 100% at α=0.05. Thus, the calculated power was p=0.00, at α=0.05, which meant there was no error associated with accepting a null hypothesis when it is false. With such statistical evidence, NECTA was confident that the selected 524 schools (287 rural and 237 urban) from the sample-frame of 12,675 public schools was sufficient to allow any statistical calculations for the DLR 6.2 and 6.3 indicators with the 2019 study comparability.

The instruments of the study were administered among 28,364 Standard III pupils who were randomly selected from 524 schools. The 2021 sample was derived to provide the estimates of pupils' performance at the national and regional levels (with disaggregation at gender and urban/rural levels). However, the study was postponed from the end of the 2021 school year to the beginning of the 2022 school year due to tight schedule of the NECTA calendar. Accordingly, conducting the study at the beginning of year 2022 Standard III pupils emerged to be the best possible approximation of the end-of-year 2021 Standard II pupils.

2.6 Verifying Sampled Schools

Before the actual data collection each assessor was assigned a school to assess. The assessor verified the schools under his/her jurisdiction in collaboration with the respective District Education Officer (DEO) and District Academic Officer (DAO) by ensuring that all the schools selected met the assessment requirements. If a school failed to meet the requirements, it was replaced as per the inclusion criteria described in Section 2.4 and as specified in Section 2.3.

2.7 Final Sample Count

After the sampling procedures, 524 schools were sampled. They had a total of 28,364 pupils. Out of these pupils, 26,984 provided data using a paper-based scale referred to as the scale group. The remaining 1,834 pupils provided data through tablets and were

referred to as the tablet group. Among the 524 sampled schools, 42 schools were selected from 21 councils drawn from 26 regions from which data was collected using tablets. The remaining 482 schools used paper-based rating scale to collect data.

2.8 Data Collection

The 2021 study was expected to be conducted among Standard II pupils by the end of October 2021. However, due to the tight schedule of the National Examinations Council of Tanzania, it was not conducted as planned. Instead, the 2022 Standard III pupils emerged as the best possible approximation of the end of 2021 Standard II pupils.

Data collection took place on 24th January 2022 and 25th January 2022. It was important to report the findings at the national and regional levels. To facilitate the reporting of results at these levels, the data was collected at the council level in all the regions of Tanzania Mainland. The sample was proportionally selected based on the enrolment contribution of the 2021 Standard II pupils to the council in the region as specified in the sampling criteria.

2.9 Marking and Data Capturing

The marking process of the paper and pencil-based Writing and Arithmetic assessment scripts was done using the Conveyor Belt System[10]. The Reading and Oral Arithmetic assessment scripts, on the other hand, were marked by the assessors during the assessment using the rating scale(s) and tablet(s) provided.

After the marking process, data were entered into the computer system. To verify accuracy of the marking and data entry, the following steps were taken:

(a) The marked scripts were independently verified to ensure that each question was fairly marked and the total mark or score was accurately captured in the computer system.

---

[10] Conveyor Belt marking system is a process of marking assessment/examination scripts where one marker marks only one question and then passes the script to another marker until the script reaches the marker of the last item.

(b) After data entry, further validation was made by comparing the printout of each school with the scores on the pupils' scripts.

(c) The data captured by tablets were uploaded directly to the server and the printout documents showing the pupils' scores were printed, checked for completeness and filed.

2.10 Data Cleaning

To clean the data, 2,781(10%) marked scripts for the pupils, who used the paper-based tool (scale), and the data captured by tablets were randomly drawn. A team of verifiers authenticated the accuracy of data entry by going through each script, comparing the data on hard copies and the computer-generated records. On the other hand, the files for the data captured by tablets included in this sample were generated for quality assurance of the data. After cleaning the data, a paired t-test was conducted for both Reading and Arithmetic to determine the relationship between the scores of the first entry (un-cleaned) and the second entry (cleaned). The results of the test revealed that the correlation between the first and second entries was 100 percent for Reading and 99.9 percent for Arithmetic skills. Thus, the margin of error for Reading and Arithmetic were 0.003 percent and 0.002 percent, respectively. The test of the relationship used to find the similarities between the two datasets reveal a high degree of precision during data entry as Table 6 illustrates.

Table 6: **Relationship between First Data entry and Cleaned Data**

Skill	Mean		SD		Standard Error (SE)		Test of relationship				Remarks
	First entry	Clean Data	First entry	Clean Data	First entry	Clean Data	Pearson Correlation	P-Value	t Stat	t Critical two-tail	
Reading	12.43	12.43	8.94	8.94	0.17	0.17	1.00	0.75	-0.33	1.96	No difference
Arithmetic	8.25	8.24	6.03	6.03	0.11	0.11	0.99	0.39	0.87	1.96	No difference

2.11 Data Weighting

The weighting of data analysis was calculated as the inverse of the selection probability for each pupil to make the sample representative of the national population. One stage of weighting was used at school level so that the sample of pupils' scores could be a representation of the overall national level of pupil performance. To account for

disproportionate sampling, all the scores reported for this study were calculated using the pupil weight as follows:

Pupils Weight =

$$\frac{Number\ of\ Standard\ 2\ pupils\ in\ the\ council}{Number\ of\ schools\ sampled\ in\ the\ council\ \times\ Number\ of\ Standard\ 2\ pupils\ in\ the\ school}$$

For the overall performance on each skill (e.g., Reading, Writing and Arithmetic) at the regional and national level, the performance was calculated based on the pupils' weight at school level. Furthermore, SPSS software was used to weight all the cases.

2.12 Data Analysis

In this report, whenever possible, the 2021 3Rs assessment is compared with historical performance data and the 2021 targets set based on the baseline data. Table 7 summarises the historical performance data on each of the key indicators against the 2021 targets.

Table 7: **Performance against the EPfR Indicators**

Reading Subtasks	Benchmark	2019 Baseline	2021 National 3Rs Study
Oral Reading Fluency	45 Correct words per minute	18.9% (±0.1)	18.1% (±0.1)
Reading for Comprehension	80% Correct	38.7% (±0.1)	41.3% (±0.1)

In order to assess the level and trend of reading fluency outcomes and achievement of 3Rs assessment targets at national level, the pupils with special needs were excluded during data analysis. Each of the EPfR indicator scores was calculated as the weighted mean of all the pupils' scores on the corresponding assessment task in the 2021 3Rs study. During the calculation of both the reading fluency (speed) (CWPM – Correct Words Per Minute) and the addition/subtraction Level II scores, omitted words and unanswered Addition and Subtraction items were treated as incorrect responses.

2.13 Adaptation of Instruments for the 3Rs Assessment

To ensure comparability of the findings between the 2019 and the 2021 study, the instruments for Oral Reading Fluency and Oral Comprehension that were used in the 2019 study were adapted. For Oral Arithmetic, the level of difficulty was maintained. This was done because the 2019 instruments, particularly the instrument on the assessment of Reading Fluency and Arithmetic level II, were equated to those of the 2016 EGRA/EGMA study. Thus, the results of the 2021 study in these areas would also be considered comparable with the 2016 study. Furthermore, reviews were made on the tools to ensure that they were accurate and did not contain any errors, which would make the assessment difficult for the pupils to take. However, no alterations were made to the tools. Thus, the adaptation made it needless to conduct an equating study.

2.14 Appointment and Training of Trainers

The training of assessors in the 2021 3Rs assessment was one of the most important stages of the assessment. When selecting prospective trainers, levels of education and experience in conducting similar studies were considered. For the purpose of this study, the selected trainers were mostly graduates in education with experience of teaching of not less than 3 years. The trainers were also supposed to have some experiences in conducting any of the NECTA activities such as items setting, moderation and invigilation of assessment or examinations. The consideration of education level and experience in selecting trainers was purposive to ensure that they can easily understand the content during the training because of their experience in handling assessment activities done by NECTA.

The training of the trainers lasted four days from 11th 2022 to 14th January 2022. The training concluded with an assessment, which occurred on the last day of the assessment. The assessment tool, which had been used in the 2019 study was adapted. It consisted of a video of a pupil who was recorded reading the assessment passage. The video was played for the trainers to rate. The pupil in the video had made several errors during reading. The assessors were, therefore, required to listen, identify those errors, rate accurately and determine the time it took for the pupil to complete the reading. The ratings of the participants were reviewed by a technical team to

determine rating accuracy. Only trainers who acquired a minimum pass or higher were allowed to participate as trainers of assessors. The minimum qualification of the participants to be appointed as trainers was set at 75 percent.

Some 248 trainers were appointed to participate in the training. Out of these, 236 trainers passed the assessment. The remaining 12 were excluded after failing to attain the minimum score required for them to qualify as trainers. Each of the successful trainers was allocated to one of the district councils on Tanzania Mainland and he/she was expected to cascade the training to his/her respective council. About two-thirds of the trainers had also participated in the 2019 study.

The 3Rs assessment technical team prepared and conducted the training of trainers. To ensure the training objectives are achieved effectively, training resources were prepared. Training manuals which were used in the 2019 3Rs study were adapted and used for the training. The purpose was to ensure that all trainers had the same understanding of the procedures for conducting the assessment to guarantee validity, reliability and fairness of the assessment.

Moreover, to ensure accuracy of the data captured, particularly during Oral Arithmetic and Oral Reading Fluency assessments, emphasis during the training was placed on the use of timing devices. Two modes of data collection were used during the assessment: Paper-based method (also called scale) and electronic method, which used tablets. All the trainers were trained on using the two methods. The tablets had inbuilt timers and, hence, the training focused on how to start and stop the timer and how to use the tablets in rating the reader.

For the paper-based data collection tool, the participants used mobile phone timers to capture the time used by the pupils during Oral Reading Fluency. This was done in order to ensure comparability between the two data collection methods. In order to avoid intermittent interruptions during data collection, the participants were trained on how to set the mobile phones in the flight mode. The trainers were expected to emphasise the same during their training of the assessors. Role plays were also used as an integral part of the training to ensure that the same procedure for leading the pupils during Oral Reading Fluency and Oral Arithmetic sessions were followed while maintaining the similarity and accuracy during data

collection. Evaluation questions were also used to assess the trainers' understanding of how to conduct the assessment.

2.15 Appointment and Training of Assessors

After the training of trainers, successful trainers were posted to the 186 councils on Tanzania Mainland. Each of the trainers was posted to one council to train the assessors. The appointment of prospective assessors was done by the National Examinations Council of Tanzania, through its Regional and District Examination Committees. The assessors appointed were qualified and experienced teachers particularly those who teach in lower classes. As was the case with the trainers, assessors who had participated in the 2019 3Rs assessment or similar assignments conducted in the country were prioritised. This purposive selection of experienced teachers was based on their good understanding of how to deal with pupils at this level of education and age group. The training of assessors took four days from 19th January 2022 to 22nd January 2022. Training manuals for the assessors, which were used during the 2019 3Rs training, were adapted for use during the current training. To ensure uniformity during data collection, assessors received instructions on using similar language patterns, particularly the language specified in the training manual. The first day of the training focused on guiding the assessors through the process of invigilating paper and pencil-based assessment of Writing and Arithmetic skills. The second day was devoted to training the assessors on how to use the timers found in mobile phones. This training session also covered the aspect of tracking and rating the readers. Role plays featured as the main methodology for practising these skills.

The third and the fourth days were reserved for practice sessions. During these two days, the assessors worked in groups and role played. One of the assessors read the passage while others assessed and rated how he/she read it. Each assessor shared the results. Thus, they helped to determine the accuracy of rating. The participants through the facilitation of the trainer discussed possible sources of errors whenever there were discrepancies in rating the reader. The discussions were followed by more practices aimed to address the weaknesses identified. The assessors further benefited from the facilitation of the trainer during the practice on how to conduct the entire assessment, that is, assess Oral Reading Fluency,

Oral Reading Comprehension and Oral Arithmetic. This holistic approach helped to determine the accuracy of the assessor in collecting data in all the three assessment sub-tasks. The trainer also conducted individual assessments prior to the final assessment. The assessment was conducted facilitated the sharing of each assessor's performance on addressing the weaknesses identified before making the final assessment, which was administered at the end of the training.

Eventually, the assessment of the assessors was done at the end of the final session of the fourth day. This final assessment evaluated the performance of each assessor in addition to determining the extent to which the assessors had acquired the necessary competencies, which would enable them to participate in data collection effectively. The assessment methodology was an adoption of the tool that had been used during the 2019 3Rs evaluation.

The tool consisted of a video of a pupil reading the same passage, which was also used in the assessment. The video was played and the assessors were required to listen, rate the reader by determining the error he/she made while reading while using timers to determine how long it took the reader to complete reading the passage. The assessors used the assessment scale, for subsequent use during the assessment to fill in the scores. Filled out forms were then collected for the trainers to review the accuracy of each assessor. The assessors, who attained the accuracy in rating of at least 80 percent, qualified for selection to participate in the actual assessment. Assessors, who failed to do so, did not take part in the study.

In all, 4,073 assessors participated in the training. Out of those 3,818 participants qualified whereas 255 failed to do so, hence their exclusion from participating as assessors in the study.

2.16 Limitations

The sampling method employed the use of a computer system, which randomly selected the schools based on proportional representation in relation to the 2021 Standard II enrolments. However, it was difficult to attain a perfect randomisation due to some unavoidable factors that necessitated the replacement of some of the schools. Nevertheless, this replacement of very few schools (n=3; 0.57%) did

not affect the data collection procedures because the replacement was done based on set criteria.

CHAPTER THREE
RESULTS

3.1 Introduction

This chapter presents data analysis and results of the study for each of the 3Rs skills assessed. The findings are presented under four major areas, namely, Benchmarks and Annual Targets in Reading and Arithmetic; Reading Skills Assessment Results; and Arithmetic Skills Assessment. The chapter also presents results for Writing Skills Assessment. Furthermore, it also indicates the status on the availability of Teaching and Learning Resources, Teaching and Learning Environment and Factors Affecting the Teaching and Learning of 3Rs.

3.2 Benchmarks and Annual Targets in Reading and Arithmetic

The national 3Rs study conducted in 2019 enabled the setting of national benchmarks and targets for Reading and Arithmetic. The purpose was to initiate an understanding of early grade pupils' performance in Reading and Arithmetic in Tanzania. The national benchmarks indicate the levels for the foundational skills in Reading and Mathematics for Standard II pupils. The annual targets show the percentage of pupils expected to reach each benchmark. Also, the targets provide the percentage of pupils scoring zero on ORF and RC, Addition and Subtraction Level II and missing numbers. Table 8 illustrates the set benchmarks.

Table 8: National Benchmarks and Annual Target for Reading and Arithmetic for Standard II Pupils

Reading	Benchmark	Percentage of Standard II Pupils at Benchmark			
		2019 Baseline	2021 Actual	2021 Target	5 -Year Target
Oral Reading Fluency	At least 45 correct words per minute	18.90%	18.10%	20%	24%
Oral Reading Comprehension	80% Correct or Higher	38.70%	41.30%	41%	45%

Reading	Percentage of Standard II Pupils Scoring Zero			
	2019 Baseline	**2021 Actual**	**2021 Target**	**5 -Year Target**
Oral Reading Fluency	15.60%	14.50%	14%	10%
Oral Comprehension	23.40%	22.60%	22%	18%

Arithmetic	Benchmark	Percentage of Standard II Pupils at Benchmark			
		2019 Baseline	**2021 Actual**	**2021 Target**	**5 -Year Target**
Addition and Subtraction Level II	80%	17.10%	19.80%	19%	23%
Missing Number	60%	39.10%	22.70%	41%	45%

Arithmetic	Percentage of Standard II Pupils Scoring Zero			
	2019 Baseline	**2021 Actual**	**2021 Target**	**5 -Year Target**
Addition and Subtraction Level II	22.80%	16.40%	21%	17%
Missing Number	16.50%	40.80%	15%	11%

3.3 Reading Skills Assessment Results

The Reading assessment had two sub-tasks: Oral Reading Fluency and Reading for Comprehension. The pupils were individually assessed using the reading assessment tool, which was administered in Kiswahili. During the assessment, each pupil had 10 minutes to complete the assessment.

This part analyses the Reading assessment results at the national level, categories of readers, performance by gender, region, rural and urban localities. To establish trends in performance, the performance of pupils is compared to that of the 2019 study.

3.3.1 National Mean Scores on Reading Sub-tasks

The important indicators for EPfR, which are indicated in DRL 6.2 and 6.3, are Oral Reading Fluency (ORF) measured in terms of number of Correct Words Per Minute (CWPM), and

Oral Reading Comprehension (RC) measured in terms of the number of correct responses after the pupil has finished reading the comprehension passage. National scores on ORF, CWPM and RC are as illustrated in Table 9.

Table 9: National Mean Scores on Oral Reading Fluency Subtask

Subtasks	2021 National 3Rs Study		
	ÉPfR 2021 Targets	Overall National Scores	Scores by Gender
			Boys	Girls
Oral Reading Fluency (CWPM)	27	27.49 (±0.03)	25.43 (±0.04)	29.46 (±0.03)
Reading for Comprehension	-	11.93 (±0.01)	11.19 (±0.02)	12.64 (±0.02)

Note: Margin of error in parentheses ()

The results show that the mean scores for ORF improved by 1.31 percent from 26.18 in the 2019 3Rs study to 27.49 in the 2021 3Rs study. Further analysis on gender indicates that more girls scored higher than boys in Oral Reading Fluency by acquiring the mean score of 29.46 CWPM compared to the 25.43 CWPM attained by boys.

3.3.2 Proportion of Pupils Reaching the Benchmarks on Reading Sub-tasks

Data analysis is based on national benchmarks which are 45 CWPM for Oral Reading Fluency and 80 percent for Reading for Comprehension. A comparison of the 2019 3Rs study was done to determine the progress towards the set targets. The analysis indicates that there is a steady increase in the percentage of pupils, who meet national benchmarks on RC, compared to the attainment of the set targets on ORF. However, the percentage of pupils achieving the benchmark on ORF in the two studies were 18.9 in 2019 and 18.1 in 2021. Even though the targets on ORF had not been reached, the targets for RC of 41 percent was achieved as illustrated in Table 10.

Table 10: Proportion of Pupils at the Tanzanian Benchmarks for Reading Subtask

Reading Subtasks	Benchmark	2019 Baseline	2021 National 3Rs Study
Oral Reading Fluency	45 Correct words per minute	18.9% (±0.1)	18.1% (±0.1)
Reading for Comprehension	80% Correct	38.7% (±0.1)	41.3% (±0.1)

Note: Margin of error in parentheses ()
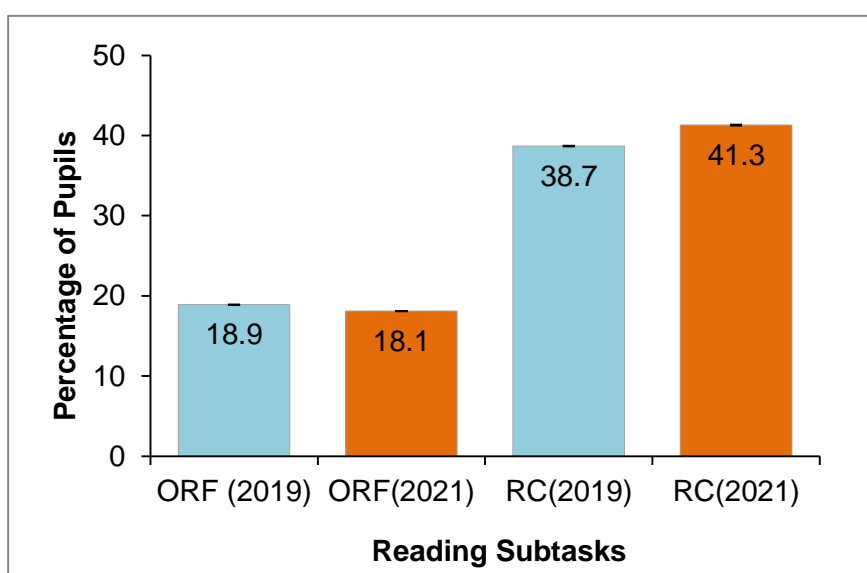
Figure 1: *Percentages of pupils scoring at the Tanzanian benchmarks for the two reading sub-tasks*

Table 10 shows that, the pupils who managed to reach 80 percent benchmark in Reading for Comprehension (RC) in 2019 and 2021 studies were 38.7 and 41.3 percent respectively. The targets set were 40 percent for 2019 and 41 for 2021. Even though the RC targets for 2019 were not met, there has been a steady increase in the number of pupils meeting the national benchmark in RC. The set targets were finally reached in the 2021 study after 41.3 percent was registered, which exceeded the target by 0.3 percent. The increase indicates an overall improvement in RC as

exemplified by rise in the percentages of pupils reaching the national benchmark.

3.3.3 Annual Target and Actual Results for Reading Sub-task Zero Scores

Results for the 2021 study indicate a shift by population from non-readers to beginning readers. Table 11 indicates the annual target and actual results for reading sub-task zero scores in the 2019 and 2021 studies.

Table 11: **Annual Target and Actual Results for Kiswahili Reading Sub-task Zero Scores**

Reading Sub-task	2019 Baseline	2021 National 3Rs Study	2021 Target	5-Year Target
Oral Reading Fluency	15.6% (±0.1)	14.5% (±0.1)	14%	10%
Reading Comprehension	23.4% (±0.1)	22.6% (±0.1)	22%	18%

Note: Margin of error in parentheses ()
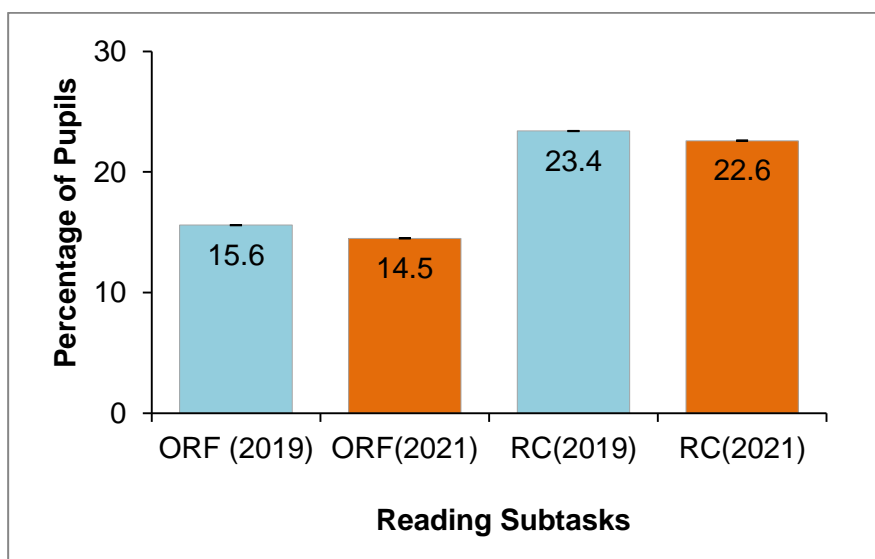
Figure 2: *The percentages of pupils who scored zero on the two reading sub-tasks*

Table 11 and Figure 2 indicate that there is an improvement in the actual results for the Kiswahili reading sub-task in zero scores primarily because the percentage of pupils with zero scores has been declining yearly from 15.6 percent in 2019 to 14.5 percent in 2021. However, the 2021 targets have yet to be met. The improvement on the number of pupils scoring zero shows that efforts made by the government to improve the teaching and learning of the 3Rs have been bearing fruit.

Some improvement is also observable in RC whereby the number of pupils with zero scores has decreased from 23.4 percent in 2019 to 22.6 percent in 2021. The set targets for ORF and RC were 14 percent and 22 percent, respectively. However, both targets were not met.

3.3.4 Categories of Readers

In the presentation of the pupils' performance, four categories have been used to express the quality of reading competencies exhibited by the pupils. These categories are non-readers, beginning readers, progressing readers and proficient readers. The construct non-readers represent the pupils who could not read a single word in the passage whereas beginning readers are those who could read from 1 to 29 words. Progressing readers are pupils who could read 30 words and above per minute and proficient readers are those who read all the 50 words per minute and could attain 80 percent of comprehension or higher. A comparison was made to identify progress of each category since the 2019 study, as shown in Table 12 and Figure 3.

Table 12: **Proportion of Readers by Category and Year**

Category	Types of Readers	Characteristics	Percentage of Pupils	
			2019 Baseline	**2021 Study**
1	Non-readers	Unable to read a single word of the passage	15.60%	14.50%

Category	Types of Readers	Characteristics	Percentage of Pupils	
			2019 Baseline	2021 Study
2	Beginning readers	Can correctly read between 1 and 29 words of the passage in one minute	37.20%	26.70%
3	Progressing Readers	Can correctly read at least 30 words of the passage in one minute	31.80%	43.80%
4	Proficient Readers	Can correctly read at least 45 words of the passage in one minute and with 80% or higher comprehension	15.40%	15.00%

Margin of error in parentheses ()
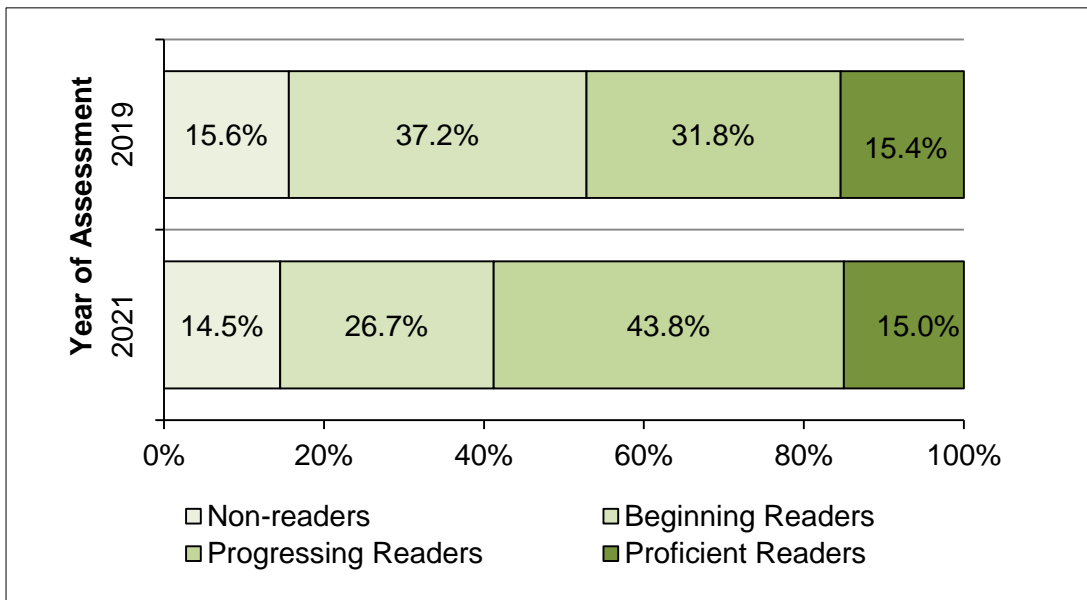
Figure 3: *Proportion of readers by category and year*

The findings show progress when compared with the results of the 2019 study. Specifically, the percentages of lower categories of readers have decreased. The percentages of non-readers have decreased from 15.60 percent in 2019 to 14.50 percent in 2021. Further analysis indicates that, the number of beginning readers has also declined in the two studies, consequently leading to an increase in the number of progressing readers from 31.80 percent in 2019 to 43.80

percent in 2021. However, the percentages of proficient readers dropped from 15.40 percent in 2019 to 15.00 percent in 2021.

3.3.5 Distribution of Scores on Reading Sub-tasks

The performance of pupils in reading sub-tasks was categorised as poor performers, average performers, good performers and very good performers. Figure 4 summarises these four categories thusly:
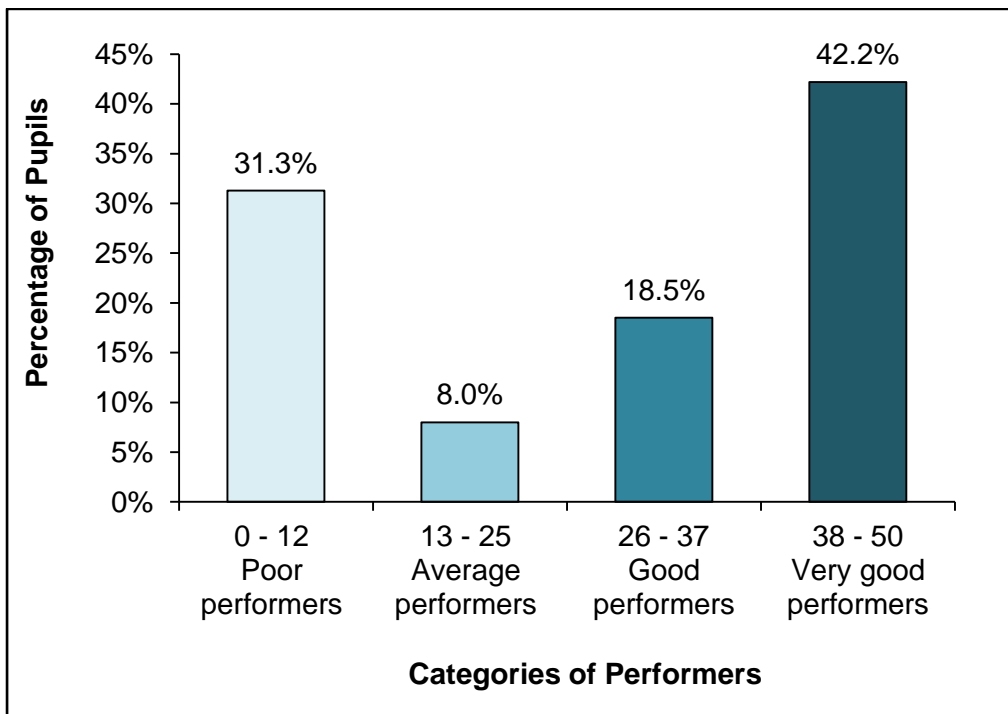
Figure 4: *Distribution of pupils' scores on the Oral Reading Fluency sub-task*

Figure 4 shows that, more pupils could read 38 to 50 CWPM (42.2%) than those who could read 12 or less CWPM (31.3%). Generally, 60.7 percent of the pupils had a good reading ability. When compared to the 2019 study, the current results represents an increase of pupils who had a good reading ability of 6.9 percent in 2021.

The RC sub-task was given to the pupils after they had read the passage. Pupils were then required to respond to five questions, four factual and one inferential. The aim of this

sub-task was to test the pupils' comprehension skills. The performance was classified in four groups based on the number of correct responses each pupil provided. Thus, there were poor performers, average performers, good performers, and very good performers.

Pupils were classified as poor performers if they could not respond correctly to more than one (1) question; average performers if they responded correctly to two (2) or three (3) questions; good performers if they were able to respond correctly to four (4) questions; and very good performers if they responded correctly to all the five (5) questions. Figure 5 shows the distribution of the pupils' performance placed in the four categories:
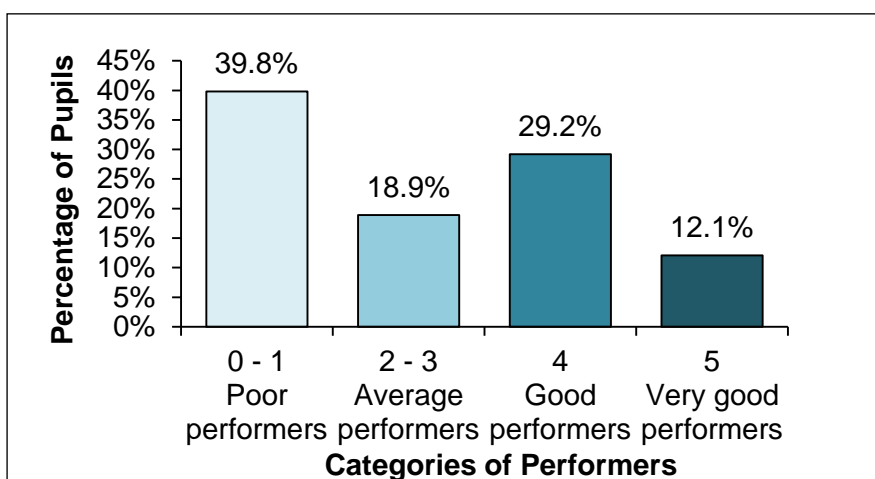
Figure 5: *Distribution of pupils' scores on the Reading Comprehension sub-task*

Figure 5 shows that 41.3 percent of the pupils were able to comprehend 80 percent or more of the passage content. In other words, more than one-third of the pupils, who participated in this assessment, were able to comprehend 80 percent or higher of the content they read. Moreover, 39.8 percent had low comprehension as they were only able to attain at most 20 percent comprehension of the content they read. The findings also indicate that 18.9 percent of the pupils had average comprehension of 40 to 60 percent. These pupils managed to respond correctly to two (2) or three (3) questions after reading the passage.

When the performance of the pupils on this sub-task was analysed based on gender, the results show that girls understand the text better than boys as 44.2 percent of them were able to comprehend 80 percent or more compared to 38.2 percent[11] of the boys who had such comprehension abilities. However, more pupils were poor and average performers than those with higher performance, as Table 13 demonstrates:

Table 13: Distribution of Comprehension Scores by Gender

Gender	Categories of Scores			
	0 - 1	**2 - 3**	**4**	**5**
Boys	43.9 (±0.1)	17.9 (±0.2)	27.4 (±0.1)	10.8 (±0.2)
Girls	36.0 (±0.1)	19.8 (±0.2)	30.9(±0.1)	13.3(±0.2)

Margin of error in parentheses ()
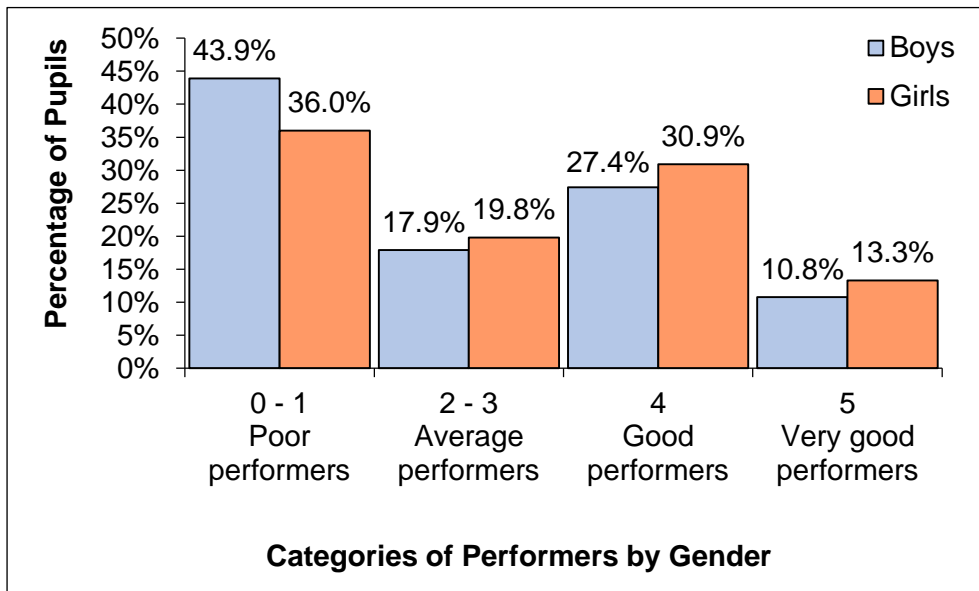
Figure 6: *Distribution of reading comprehension scores by gender*

When disaggregated by localities, the data shows that pupils from urban performed better than those from rural settings in

---

[11] Significant association was found between the categories of scores on Reading for Comprehension across gender, x2(3,1771513) =8683.8, p = 00. Girls are more likely than boys to comprehend reading passages at this stage.

35

both Oral Reading fluency[12] and Reading for Comprehension[13]. Regarding the proportion of pupils who had scored zero on reading sub-tasks (Table 14, Figure 7), the results indicate that, more pupils from rural schools scored zero on ORF (16.4%) and RC (26.4%) than those from urban schools which had 12.1 percent and 18.1 percent on the two tasks, respectively.

Table 14: **Proportion of Pupils Scoring Zero on Reading Sub-tasks by Locality**

Reading Subtasks	2021 National 3Rs Study				2021 Target	5-Year Target
	National Scores by Localities		Scores within Localities			
	Urban	Rural	Urban	Rural		
Oral Reading Fluency	5.4% (±0.1)	9.0% (±0.1)	12.1% (±0.1)	16.4% (±0.1)	14%	10%
Reading Comprehension	14.5% (±0.1)	8.2% (±0.1)	18.1% (±0.1)	26.4% (±0.1)	22%	18%

Margin of error in parentheses ()

---

[12] There is a statistically significant difference in the distribution of scores among rural/urban in ORF, x2(3, 1716503) =23676.360 p=.00. This means that girls outperformed boys in Oral Reading Fluency Subtask.

13 More pupils from rural areas had statistically significant zero scores in Oral Reading for Comprehension. X2(1.1716401) =16980.01 p =.00 as compared to urban-based pupils.
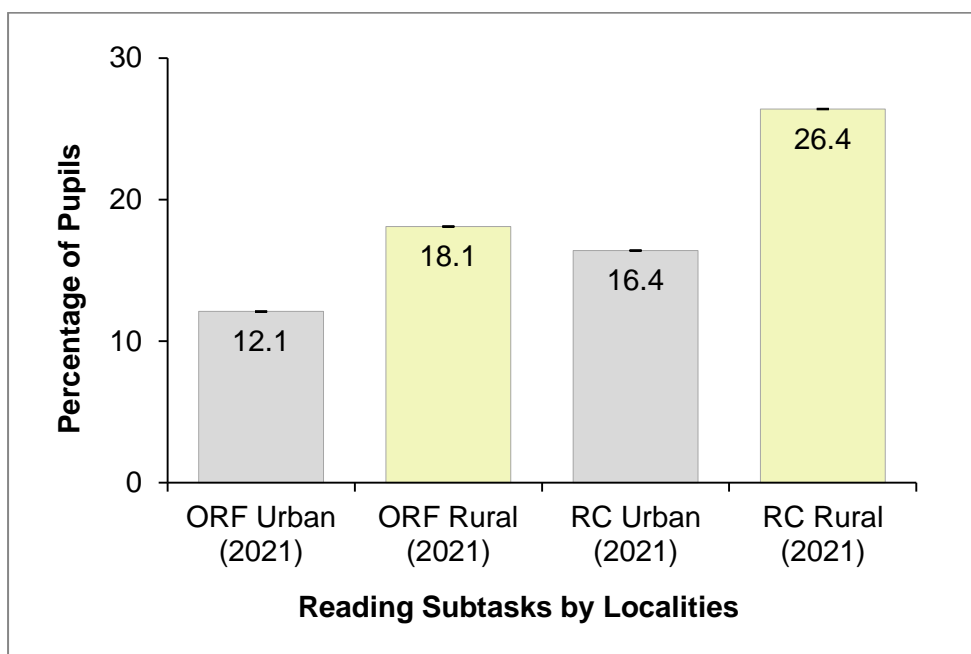
Figure 7: *Proportion of pupils who scored zero on Reading sub-tasks by locality*

3.3.6 Performance of Pupils on Reading Sub-tasks by Gender

Further data analysis based on the categories of readers by gender produced results of the performance of pupils in each category, which have been presented in Table 15 and Figure 8.

Table 15: **Proportion of Pupils by Category of Readers by Gender**

Category	Type of Reader	Characteristic	2019 Baseline		2021 (22) 3R'Study	
			Girls	Boys	Girls	Boys
1	Non-readers	Unable to read a single word of the passage	13.8%	17.5%	12.6%	16.4%
2	Beginning readers	Can correctly read between 1 and 29 words of the passage in one minute	33.6%	40.8%	23.9%	29.7%
3	Progressing readers	Can correctly read at least 30 words of the passage in	34.7%	28.8%	45.5%	42.1%

Category	Type of Reader	Characteristic	2019 Baseline		2021 (22) 3R'Study	
			Girls	Boys	Girls	Boys
		one minute				
4	Proficient readers	Can correctly read at least 45 words of the passage in one minute and with 80% or higher comprehension	17.9%	12.9%	18.0%	11.8%

Categories of Readers, 2021

Pupils	Non-readers	Beginning Readers	Progressing Readers	Proficient Readers
All Pupils	14.5%	26.7%	43.8%	15.0%
Girls	12.6%	23.9%	45.5%	18.0%
Boys	16.4%	29.7%	42.1%	11.8%

Percentage of Pupils

☐ Non-readers ☐ Beginning Readers
☐ Progressing Readers ☐ Proficient Readers

Categories of Readers, 2019

Pupils	Non-readers	Beginning Readers	Progressing Readers	Proficient Readers
All Pupils	15.6%	37.2%	31.8%	15.4%
Girls	13.8%	33.6%	34.7%	17.9%
Boys	17.5%	40.8%	28.8%	12.9%

Percentage of Pupils

☐ Non-readers ☐ Beginning Readers
☐ Progressing Readers ☐ Proficient Readers

Figure 8: *Proportion of readers by category and gender*

Table 15 and Figure 8 show that the percentages of girls in the categories of progressing and proficient readers was

higher than those of boys[14]. Moreover, girls improved in both categories of progressing and proficient readers. Boys improved by 11.1 percent in the beginning readers' category. Generally, there is a significant numerical increase of progressing readers by 13.3 percent when compared to 2019. The data suggests that the numbers of non-readers and beginning readers are decreasing progressively.

3.3.7 Performance of Pupils by Location (Rural versus Urban Settings)

Data were further analysed to find out whether there was a significant difference between the performance of pupils in rural and urban schools. Out of the 524 sampled schools, 287 were rural based and 237 were urban-based. The comparison of urban and rural schools was based on the availability of resources, particularly the distribution of human resources (teachers). On teacher deployment data demonstrates that urban areas had better teacher-pupil ratios than their rural counterparts. Table 16 summarises the category of readers by their locality:

Table 16: **Proportion of Pupils by Category of Readers and by Locality**

Category	Type of Reader	Characteristic	2021 Study	
			Urban	Rural
1	Non-readers	Unable to read a single word of the passage	12.1%	16.4%
2	Beginning readers	Can correctly read from 1 to 29 words of the passage in one minute	23.5%	29.4%
3	Progressing readers	Can correctly read at least 30 words of the passage in one minute	45.6%	42.4%
4	Proficient readers	Can correctly read at least 45 words of the passage in one minute	18.8%	11.8%

---

[14] A significant association was obtained between categories of readers and gender, $x^2(3,1771513) = 21782.6$, p = 00, hence indicating that girls were better in reading than boys.

Category	Type of Reader	Characteristic	2021 Study	
			Urban	**Rural**
		and with 80% or higher comprehension		
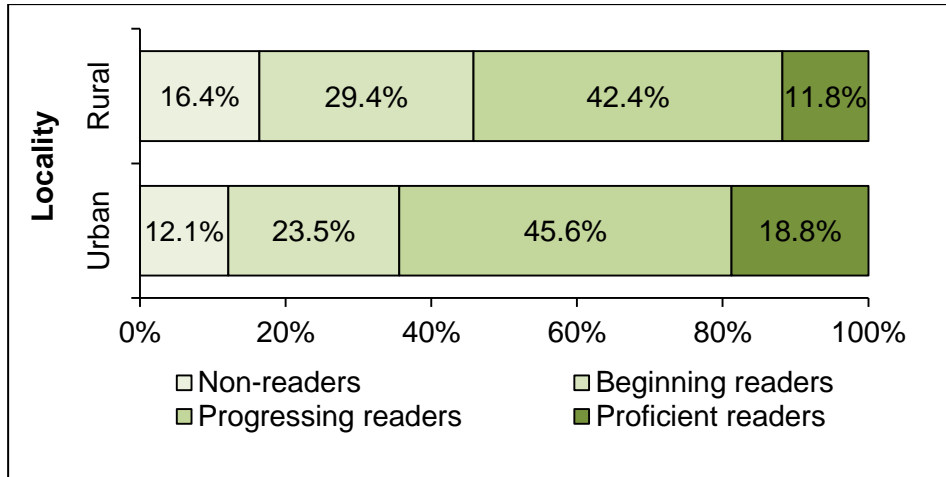
Figure 9: *Proportion of readers by category and locality*

The data in Table 16 and Figure 9 indicate that pupils in urban schools were better readers than those in rural-based schools. Indeed, there were more pupils in the progressing readers and proficient readers in urban schools (64.4%) than in rural-based schools (54.2%). In addition, urban schools had a bigger proportion of proficient readers[15] (4.6%) than in rural-based schools in this category (2.4%). Furthermore, the data indicate that there are more non-readers in rural schools (16.4%) than in urban schools (12.1%).

3.3.8 Performance of Pupils on Reading Sub-tasks by Region

Data was further analysed to compare pupils' performance at the regional level as indicated in Figure 10. The data shows that 10 regions had a good performance of between 18.2 and

---

[15] A significant relationship was found between readers category and localities (Urban/Rural), $x^2(3,1771513) = 16327.9$, $p=.00$. This signifies that, urban areas have more pupils with good reading skills than rural areas.

37.3 percent, which is above the national mean (18.1%) in the Oral Reading Fluency sub-task. Figure 11 suggests that 15 regions registered the performance of between 41.4 and 63.0 percent on the RC sub-task, which is also above the national mean (41.3%). The 10 regions that performed above the national mean on RC also performed above the national mean on ORF. Furthermore, five regions performed better on RC than on ORF. The overall national mean percentage scores in RC and ORF increased by 2.6 percent and 12.9 percent, respectively.

The analysis of the scores involving combining the two sub-tasks ORF and RC was done. Figure 12 presents the results, which show that 9 regions that performed above the national average on ORF and RC also had good performance also when the two sub-tasks were combined. On the other hand, three regions in both sub-tasks had extremely low mean scores percentage of pupils who performed at the set benchmarks (see figures 10, 11 and 12).
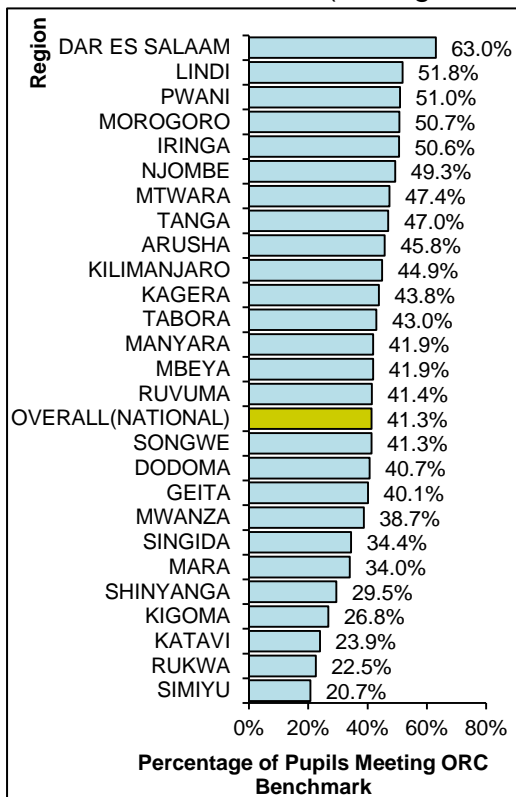
Figure 10: *Regional performance on ORF*
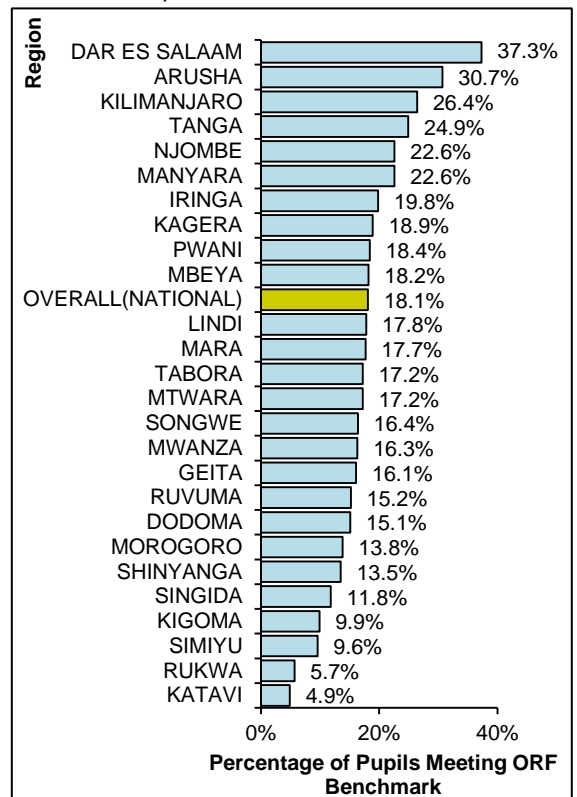
Figure 11: *Regional performance on RC*
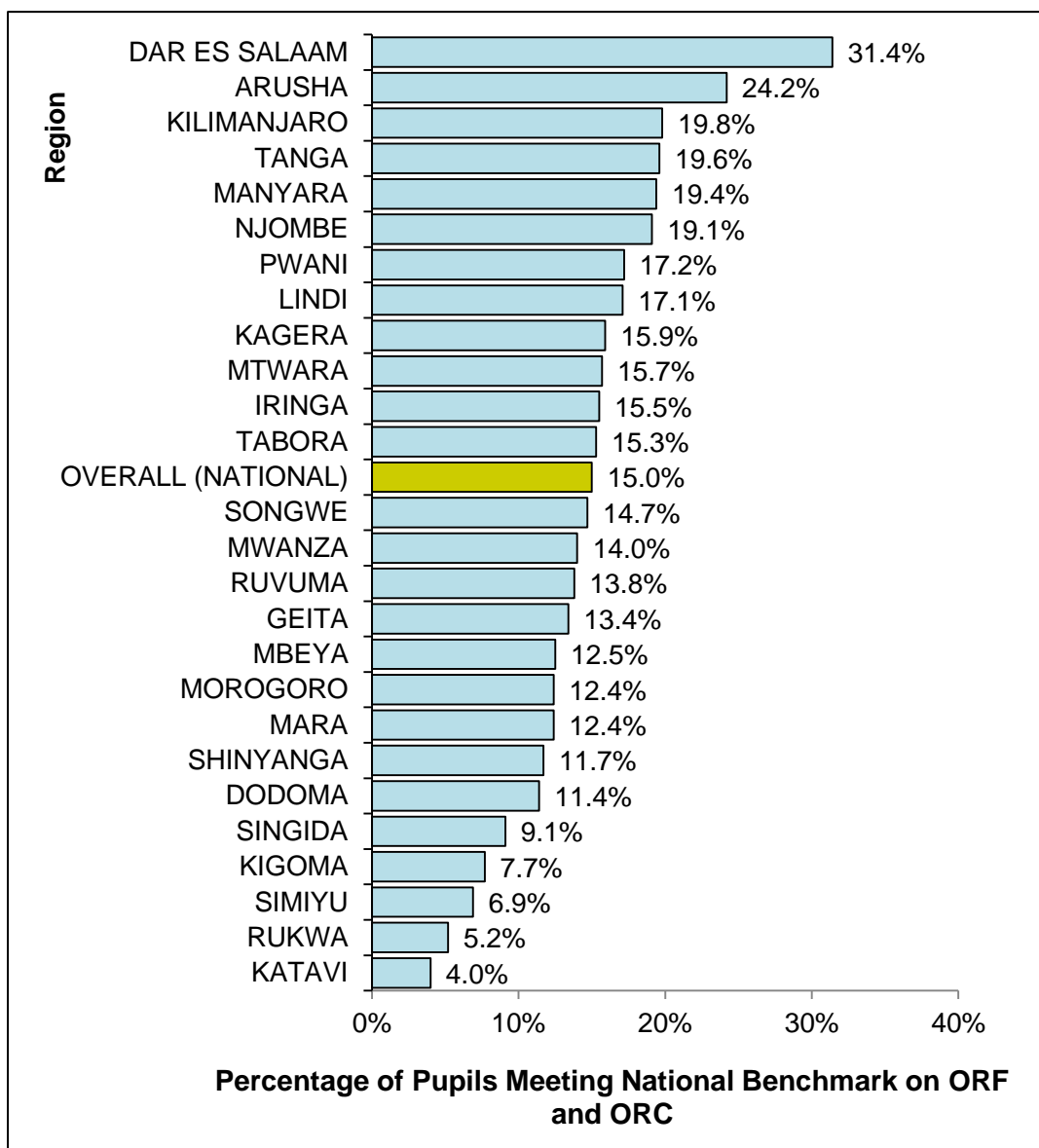
Figure 12: *Regional percentages of pupils who met the RC benchmark*

Data analysis based on gender aimed to generate mean scores for ORF and RC was done regionally, and the results appear in Figures 13 and 14 (see also Appendices 1 and 2).

Percentage of Regional Mean Scores on ORF by Gender

Region	Boys	Girls
SONGWE	47.8%	58.0%
SIMIYU	39.3%	49.1%
NJOMBE	50.5%	64.9%
KATAVI	32.1%	32.8%
GEITA	55.6%	59.4%
MANYARA	49.5%	60.9%
TANGA	58.5%	69.7%
TABORA	50.0%	55.4%
SINGIDA	41.4%	48.5%
SHINYANGA	38.8%	46.5%
RUVUMA	45.4%	53.2%
RUKWA	34.5%	40.9%
PWANI	48.4%	57.1%
MWANZA	52.1%	56.4%
MTWARA	45.0%	53.8%
MOROGORO	53.2%	58.3%
MBEYA	54.2%	64.7%
MARA	47.6%	56.4%
LINDI	44.0%	50.8%
KILIMANJARO	58.8%	69.0%
KIGOMA	38.9%	45.9%
KAGERA	58.4%	66.7%
IRINGA	57.2%	71.4%
DODOMA	54.2%	65.5%
DAR ES SALAAM	68.7%	78.3%
ARUSHA	60.7%	71.7%

Percentage of Pupils

☐ Boys   ☐ Girls

Figure 13: *Regional Distribution of Scores on the ORF sub-task by Gender*

The results in Figure 13 show improvements in the performance of pupils region-wise in ORF. Arusha accounted for the highest improvement of 9.1 percent in 2021 when compared to the 2019 study. Geita had the lowest improvement of 0.37 percent whereas Morogoro registered

44

the most significant decline of 15.2 percent. Kilimanjaro saw a minor slump in improvement of 0.5 percent. Figure 14 shows that on the RC sub-task, Kagera registered the highest improvement of 17.6 percent followed by Arusha and Mwanza each with an improvement of 10.7 percent. On the other hand, Morogoro and Simiyu regions registered declines of 12.1 and 10.0 percent, respectively.

Percentage of Regional Mean Scores on ORC by Gender

Region	Boys	Girls
SONGWE	45.9%	51.5%
SIMIYU	27.8%	32.5%
NJOMBE	53.5%	64.0%
KATAVI	33.3%	31.5%
GEITA	44.3%	45.7%
MANYARA	41.9%	54.3%
TANGA	49.8%	56.2%
TABORA	46.3%	48.6%
SINGIDA	38.6%	45.2%
SHINYANGA	33.3%	39.9%
RUVUMA	43.1%	50.2%
RUKWA	29.3%	36.1%
PWANI	49.9%	56.8%
MWANZA	44.2%	44.6%
MTWARA	46.4%	56.1%
MOROGORO	52.4%	56.1%
MBEYA	46.7%	53.4%
MARA	38.4%	46.3%
LINDI	51.0%	58.2%
KILIMANJARO	53.5%	62.9%
KIGOMA	30.3%	37.8%
KAGERA	49.8%	52.1%
IRINGA	52.1%	64.3%
DODOMA	43.7%	54.2%
DAR ES SALAAM	62.5%	69.3%
ARUSHA	49.9%	57.1%

Percentage of Pupils

☐ Boys   ☐ Girls

Figure 14: *Regional Distribution of Scores on the ORC sub-task by Gender*

45

The difference in performance between girls and boys in both sub-tasks is evident in Figures 13 and 14. Regions such as Dar es Salaam, Arusha, Iringa, Tanga and Kilimanjaro present clear differences in their performance on ORF between girls and boys. The same trend is also observable on the RC sub-task in Dar es Salaam, Iringa, Njombe and Kilimanjaro. Regions which had the performance of pupils of below the national mean score in both sub-tasks are Katavi, Kigoma, Rukwa, Simiyu and Shinyanga.

3.3.9 Analysis of Item Difficulty in Reading Skills Subtask

The items' difficulty analysis was done to establish the extent to which pupils performed on each Reading sub-task. The analysis of performance of pupils on ORF established the percentages of the correct reading of each word. The results show that more pupils found it difficult to read the word *Ng'alo*. This was exemplified by the lower percentages (31.6%) of pupils who managed to read it. The word was difficult to pronounce because it is composed of a syllable that has a *nasal sound Ng'a*. Most of the pupils also failed to pronounce the word *Subira* correctly. They pronounced it incorrectly as *Subila.* This difficulty can be associated with the mother-tongue interference. The data reveal that pupils had difficulties in pronouncing words made of consonant clusters such as *amecho_mwa, alishi_ndwa, wali_mpeleka* and *ho_spitali*. Further analysis indicates that the percentages of the correct words read decreased towards the end of the passage. Implicitly, most of the pupils were not fluent enough to read all the words in the passage within one minute (see Figure 15).
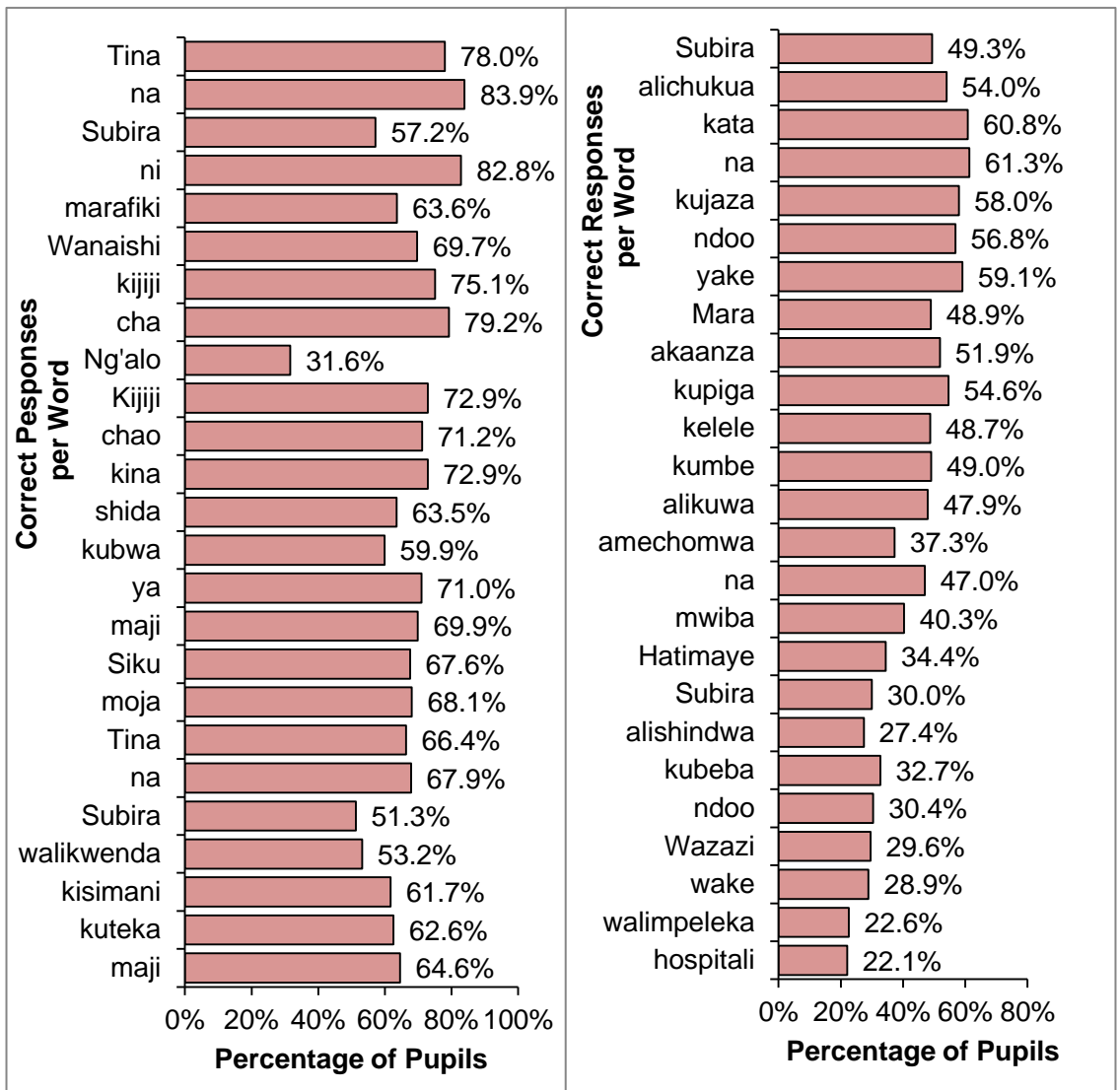
Figure 15: *Percentages of correct attempts on each word in the passage*

The findings on RC indicate that the first question was less difficult to the pupils than the second and fourth questions. The two questions seemed difficult for the pupils as most of the pupils, 63.3 percent and 61.8 percent respectively, were unable to respond correctly to the questions. The analysis of data indicates that, the three questions that required them to recall names and make inference were easier than the two questions that required them to recall facts. Figure 16

47

illustrates the responses of the pupils to each question for the RC sub-task:
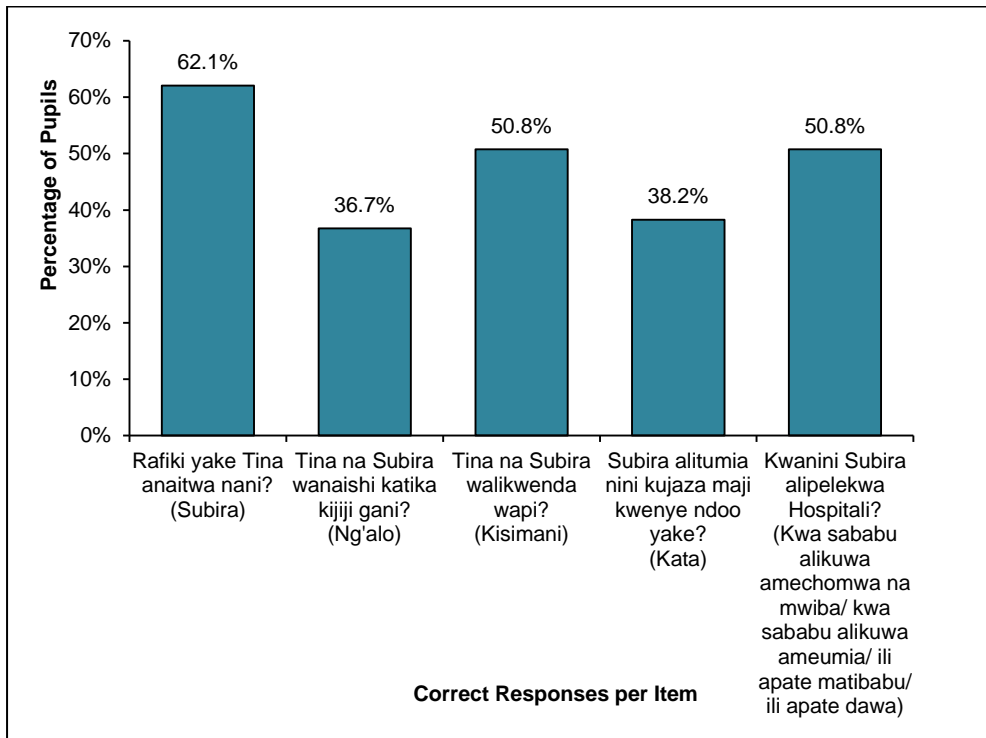
Figure 16: *Percentages of correct responses to each question on the RC sub-task*

3.4 Arithmetic Skills Assessment Results

The Arithmetic assessment tool had three sub-tasks. These are Addition and Subtraction at Level II, Missing Number and Problem-solving. Missing Numbers and Word Problems sub-tasks were administered separately with pupils via the paper and pencil strategy on the first day of the assessment. Oral Reading Fluency and Oral Arithmetic were done on the second day. The Missing Numbers sub-task consisted of five items. The patterns of numbers in the items were of two categories: Patterns consisting of increasing values and those comprising decreasing values. The problem-solving sub-task consisted of five-word problems. The problems required the application of Addition or Subtraction knowledge.

The Addition and Subtraction Level II sub-task was assessed alongside ORF and RC. This sub-task consisted of five Addition items and five Subtraction Level II items, thus a total of 10 items.

3.4.1 National Mean Scores on Arithmetic Subtasks

The analysis of data indicates that the national overall mean score on Addition and Subtraction Level II, Missing Numbers and Word Problem were 43.31(±0.1), 28.75(±0.1) and 40.66(±0.1), respectively. Further analysis shows that pupils performed significantly lower in the Missing Number sub-task than in the other two sub-tasks (Addition and Subtraction Level II and Word Problems). When disaggregated by gender at national level, data shows that girls performed better in all three subtasks than boys.

Comparison of pupils' performance between the 2019 and 2021 3Rs studies reveals an increase in the national mean percentage scores in the Addition and Subtraction Level II and Word Problems Solving sub-tasks from 39.9 to 43.31 and 39.9 to 40.66, respectively. However, the performance on the Missing Numbers sub-task dropped from 42.1 in the 2019 study to 28.75 in the 2021 study.

Moreover, the results indicate that girls performed above the national mean scores in Addition and Subtraction Level II, and Word Problem sub-tasks compared to boys. Parametric tests were conducted to establish whether the differences were statistically significant. The results confirmed that the difference in mean scores between boys and girls on Addition and Subtraction Level II was statistically significant for girls (43.48 ± 30.16) compared to boys (43.13 ± 30.08), t(1646727)=7.46, p=0.00. The tests also confirmed statistically significant gender-based differences between the performance of boys and girls in Word Problems sub-task (41.51 ± 34.07) (39.75 ± 34.56), t(1646727)=32.92, p=0.00, which implies that girls performed significantly better in Word Problem than boys.

However, for the Missing Numbers sub-task, the parametric test indicates that boys (29.28 ± 32.71) performed better than girls (28.25 ± 30.82), t(1646727)=20.77, p=0.00. Therefore,

the boys had a significantly better performance in Missing Numbers than girls. Table 17 shows the overall mean scores for the three sub-tasks and the corresponding disaggregation by gender:

Table 17: National Mean Scores for Arithmetic Sub-tasks

Sub-task	2021 National 3Rs Study		
	Overall National Mean Scores	Mean Scores by Gender	
		Boys	Girls
Addition and Subtraction (Level II)	43.31 (±0.1)	43.13 (±0.1)	43.48 (±0.1)
Missing Number	28.75 (±0.1)	29.28 (±0.1)	28.25 (±0.1)
Word Problem	40.66 (±0.1)	39.75 (±0.1)	41.51 (±0.1)

Margin of error is in parentheses ()
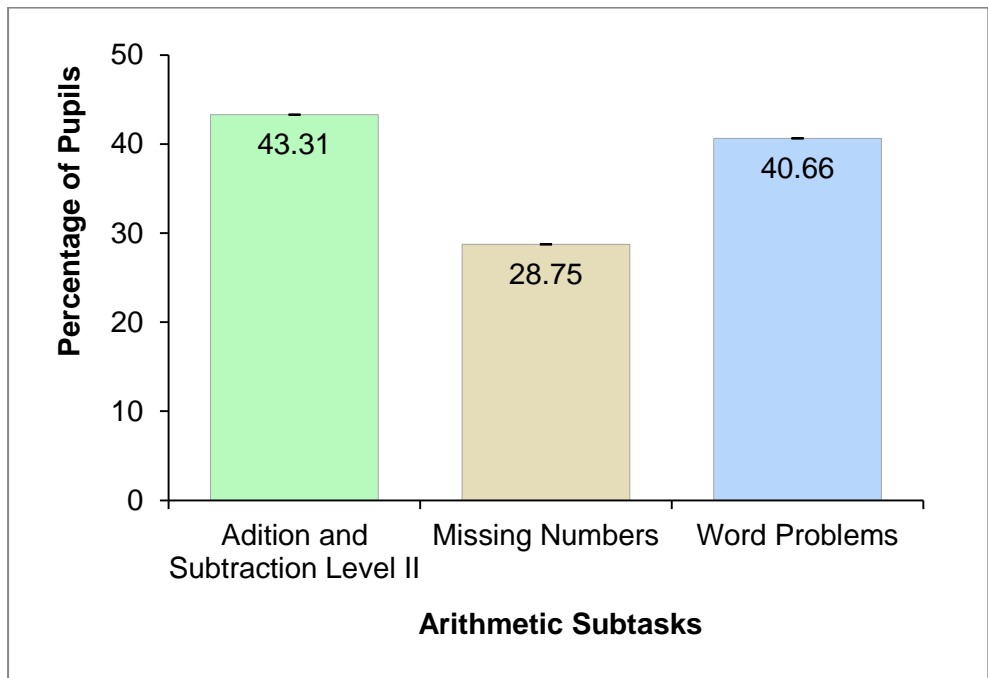
Figure 17: *National Mean Scores on Arithmetic Sub-tasks*

3.4.2 Distribution of Scores in Arithmetic Sub-task

The performance of pupils was categorised into four Arithmetic skill groups: Poor performers, Average performers, Good performers and Very good performers. Pupils had poor performance if they responded correctly to less than 5 questions; they had average performance if they answered correctly 5 or 6 questions; they had good performance if they responded correctly to 7 or 8 questions; and they had a very good performance if they responded correctly to 9 or all 10 questions. Figure 18 shows the distribution of pupils' scores for the four categories:
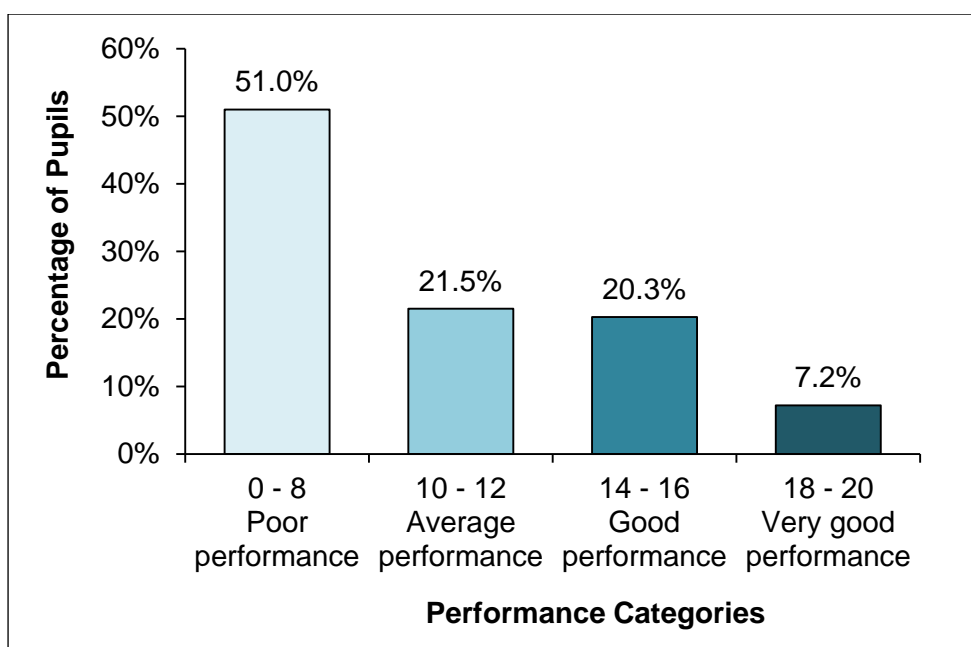
Figure 18: *Distribution of scores for Arithmetic sub-tasks*

Figure 18 shows that more than half of the pupils (51.0%) performed poorly. In other words, they could not answer correctly more than 8 of all the items in the three sub-tasks. On the other hand, 27.5 percent had good and very good performance and 21.5 percent were average performers. Impliedly, they were able to respond correctly to between 10 and 12 out of the 20 items in all the sub-tasks. Generally, the performance of pupils in Arithmetic can be described as weak since only 27.5 percent answered correctly 14 to 20 items.

51

3.4.3 Tanzania National Benchmarks for Arithmetic

The national benchmark for Arithmetic is set at 80 percent of the correct answers for Addition and Subtraction Level II and 60 percent of the correct answers on Missing Numbers. However, for EPfR purposes, the target for 2020 was reviewed to stand at 19 percent of the pupils attaining the national target in Arithmetic. Table 18 presents the proportion of pupils scoring attaining the Tanzania benchmark.

Table 18: Proportion of Pupils Attaining the Tanzania Arithmetic Benchmark

Arithmetic Sub-task	Benchmark	2019 Baseline	2021 3Rs Study	2021 Target	5-Year Target
Addition and Subtraction (Level II)	80% on the Addition and Subtraction (Level II) sub-task	17.1% (±0.1)	19.8% (±0.1)	19%	23%
Missing Numbers	60% on Missing Numbers Subtask[16]	39.1% (±0.1)	22.7% (±0.1)	41%	45%

Margin of error is in parentheses ()

Table 18 shows that 19.8 percent of the pupils scored at the national benchmark on Addition and Subtraction Level II and 22.7 percent scored at the national benchmark on Missing Numbers. The annual targets for Addition and Subtraction Level II and Missing Numbers were 19 and 41 percent, respectively. These results indicate that the targets for the 2021 assessment were in Addition and Subtraction Level II by 0.8 percent. The mean scores have improved by 2.7 percent in Addition and Subtraction Level II when compared to the 2019 study. On the contrary, the performance in Missing Numbers declined by 16.4 percent from 39.1 in 2019 to 22.7 percent in 2021.

When disaggregated by gender, the results show that more girls (20.0%) scored above the national mean of 19.8 percent in Addition and Subtraction Level II than boys, who scored below the national mean by 0.2 percent of the pupils who did

---

[16]Not included in the EPfR disbursement calculation for 2021

so. For the Missing Numbers sub-task, more boys than girls scored above the national mean by 1.3 percent. The girls scored below the national mean by 1.2 percent as Table 19 illustrates:

Table 19: National Summary of Pupils' Scores on the Arithmetic Sub-task by Gender

Arithmetic Sub-task	Benchmark	Boys	Girls
Addition and Subtraction (Level II)	80% in the Addition and Subtraction (Level II) Subtasks	19.6% (±0.1)	20.0% (±0.1)
Missing Number	60% in Missing Number Subtask	24.0% (±0.1)	21.5% (±0.1)

Margin of error is in parentheses ()

3.4.4 Proportion of Pupils Who Scored Zero in Arithmetic

The proportion of pupils, who scored zero in the Arithmetic Skills assessment, was computed to determine whether there was any tangible progress registered. Table 20 presents the results:

Table 20: Proportion of Pupils who scored zero in Arithmetic

Overall National Mean Scores				
Subtasks	**2019 Baseline**	**2021 Study**	**2021 Target**	**5-Year Target**
Zero scores on the Addition and Subtraction Subtasks	22.8% (±0.1)	16.4% (±0.1)	21%	17%
Zero scores on Missing Numbers Subtask	16.5% (±0.1)	40.8% (±0.1)	15%	11%

Margin of error is in parentheses ()

The results presented in Table 20 indicate that 16.4 percent of the pupils scored zero on the Addition and Subtraction sub-tasks whereas 40.8 percent scored zero on the Missing Number sub-task. When compared to the 2019 study, the number of zero scores has been dropping steadily in Addition

53

and Subtraction but increased from 16.5 percent in 2019 to 40 percent in 2021.

3.4.5 Categories of Performers in Arithmetic Sub-tasks

The performance in Arithmetic falls into four categories: Non-performers, Emergent performers, Approaching benchmark performers and Benchmark performers. These categories have been described as follows:

(a) Non-performers – The score in the Missing Number sub-task equals zero and/or the score in the Addition and Subtraction (Level II) sub-tasks equals zero.

(b) Emergent performers – The scores in both the Missing Number sub-task and the Addition and Subtraction (Level II) sub-tasks are above zero.

(c) Approaching benchmark performers – The score in either the Missing Number sub-task or the Addition and Subtraction (Level II) sub-task is at or above the Tanzania benchmark.

(d) Benchmark performers – Both the scores in the Missing Number sub-task and the Addition and Subtraction (Level II) sub-tasks are at or above the Tanzania benchmark.

The data analysed indicates that the performance of the pupils in Arithmetic had fluctuated for all the categories of performers between 2019 and 2021. The benchmark performers decreased from 11.7 percent in 2019 to 9.2 percent in 2021. In the two studies, the percentage of non-performers has been increasing from 35.4 percent in 2019 to 45.3 percent in 2021. On the other hand, there was a decrease in the percentage of pupils among the approaching benchmark performers and benchmark performers in 2021. Moreover, a slight improvement was evident among the emerging performers when the data were compared to the

2019 results. Figure 19 shows the distribution of pupils by categories of performance:
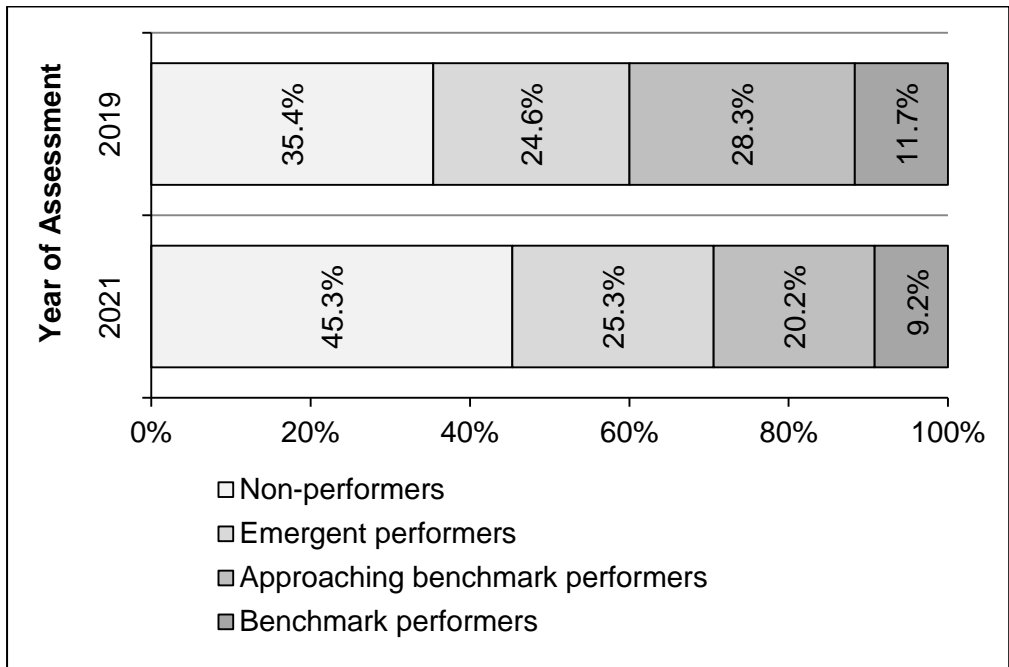
Figure 19: *Categories of performers in Arithmetic sub-tasks*

3.4.6 Distribution of Arithmetic Scores in Arithmetic Sub-tasks by Gender

The data was also analysed to disaggregate scores in Arithmetic sub-tasks by gender. The data indicates that generally pupils from both genders poorly performed on all Arithmetic sub-tasks (51.5% boys and 50.5% girls).

Analysis to determine whether there was a significant difference between boys and girls in terms of distribution of scores in the Addition and Subtraction Level II sub-task revealed a statistically significant difference in performance categories and gender $x2(3, 1646729) =373.974$ p=.00. In other words, the girls' performance was more appealing than that of boys in Addition and Subtraction sub-tasks, as Figure 20 illustrates:
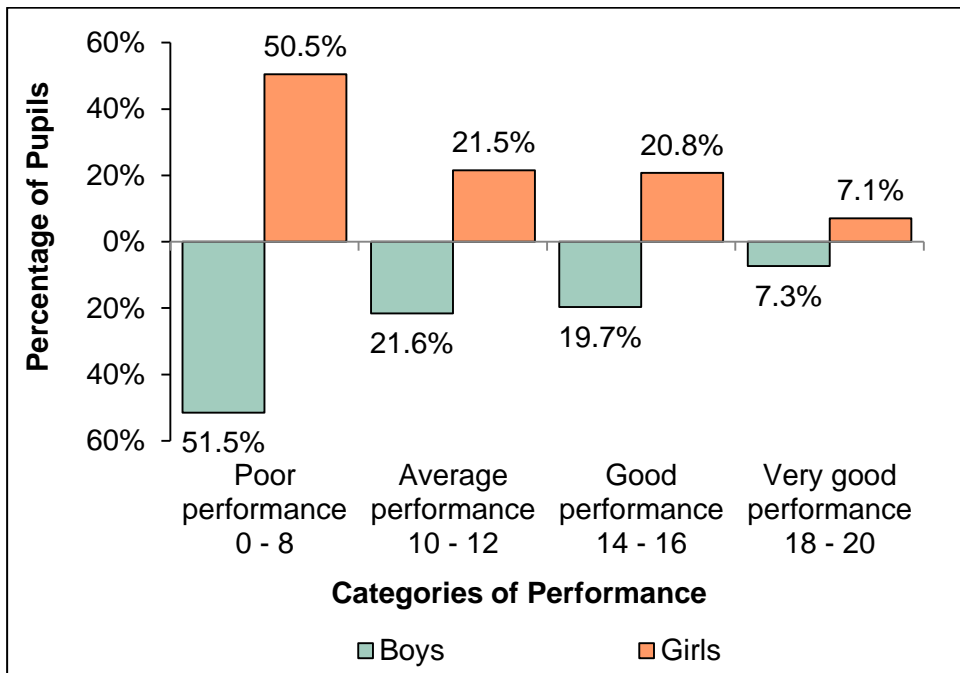
Figure 20: *Distribution of scores in Addition and Subtraction by gender*

A comparison for the Word Problems sub-task indicates a similar trend. The results further show a statistically significant difference in the distribution of scores in Word Problems x2(3, 1646731) =521.144, p=.00. In other words, the distribution of scores for girls was more appealing than that of boys. Figure 21 further illustrates the results:
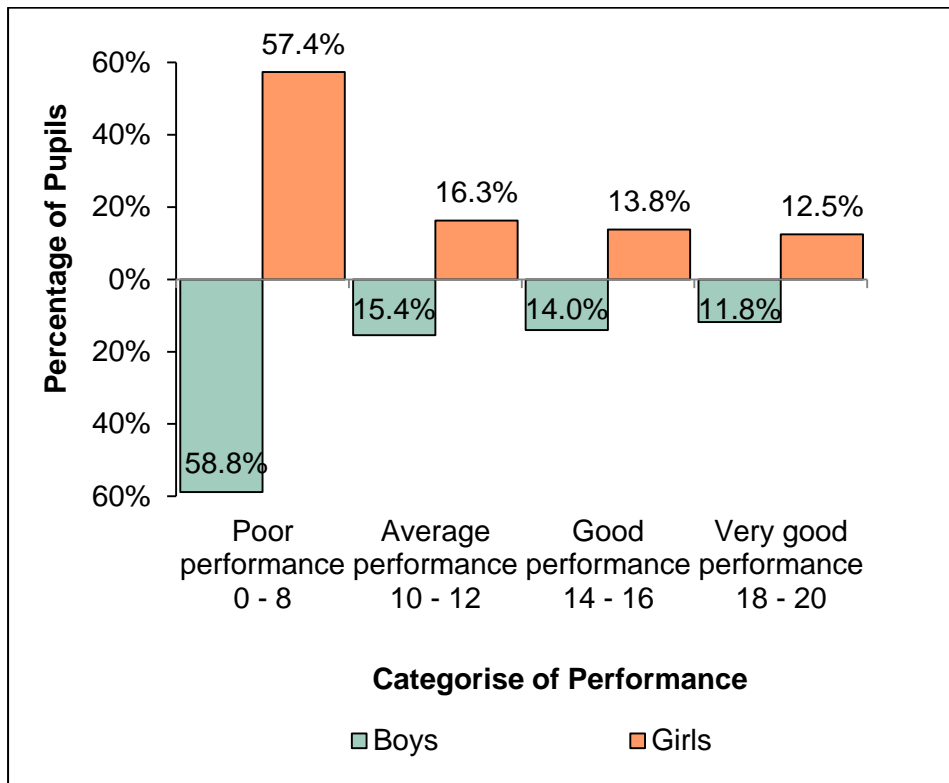
Figure 21: *Distribution of scores in Word Problems by gender*

The comparison made for the Missing Numbers sub-task indicates a better performance of boys than that of girls. The results also show a statistically significant difference in the distribution of scores for the Missing Numbers $x2(3, 1646730)$ $=3997.943$, $p=.00$. The distribution of scores for boys was more appealing than that of girls, as Figure 22 illustrates:
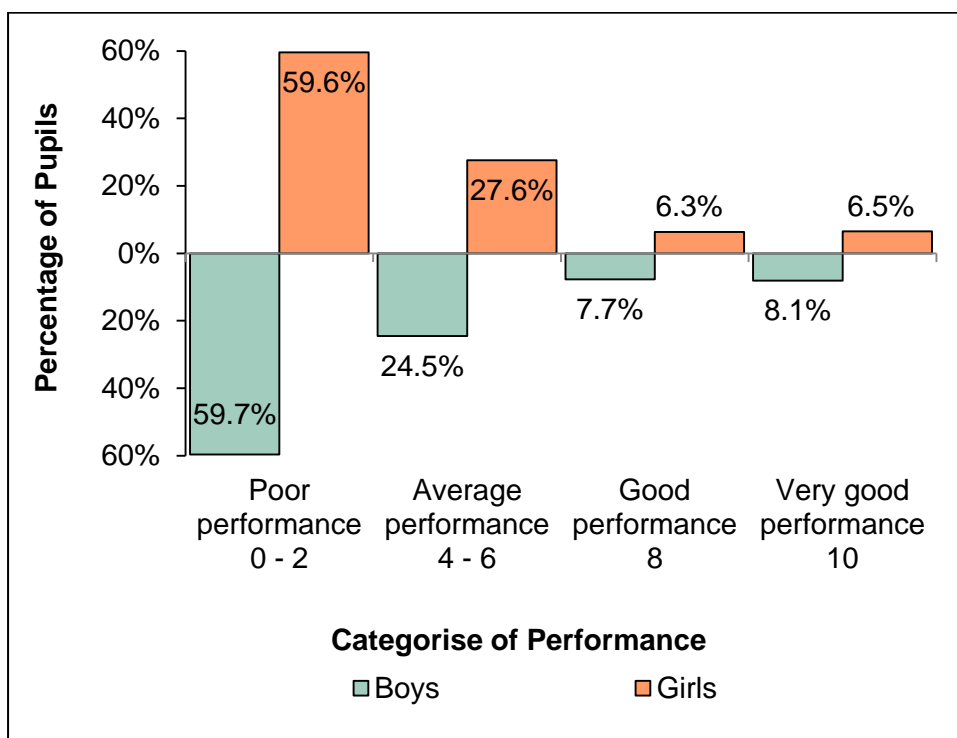
Figure 22: *Distribution of scores for the Missing Number sub-task by gender*

3.4.7 Summary of Arithmetic Scores by Region

Data analysis further differentiated pupils' performance in each region. The results show that, the performance of the pupils in 13 regions was above the national mean score in Addition and Subtraction (Level II) and for Missing Numbers. The region with the highest proportion of pupils performing at the national mean score was Dar es Salaam, which registered 43.4 percent. Rukwa accounted for the lowest proportion of pupils performing at the national benchmark with 5.5 percent.

Moreover, the proportion of pupils scoring at the national benchmark in 13 regions was above the national mean for both Addition and Subtraction Level II (19.8%) and Missing Numbers (22.7%). The percentage of pupils scoring at the national benchmark in the remaining 9 regions was below the national mean. However, there was an improvement in the 2021 study when compared to 2019 when 12 regions had

registered scored above the national mean. The summaries of the proportion of pupils scoring at the national benchmark in Addition and Subtraction Level II and Missing Numbers for each region are as presented in Figures 23 and 24, respectively:
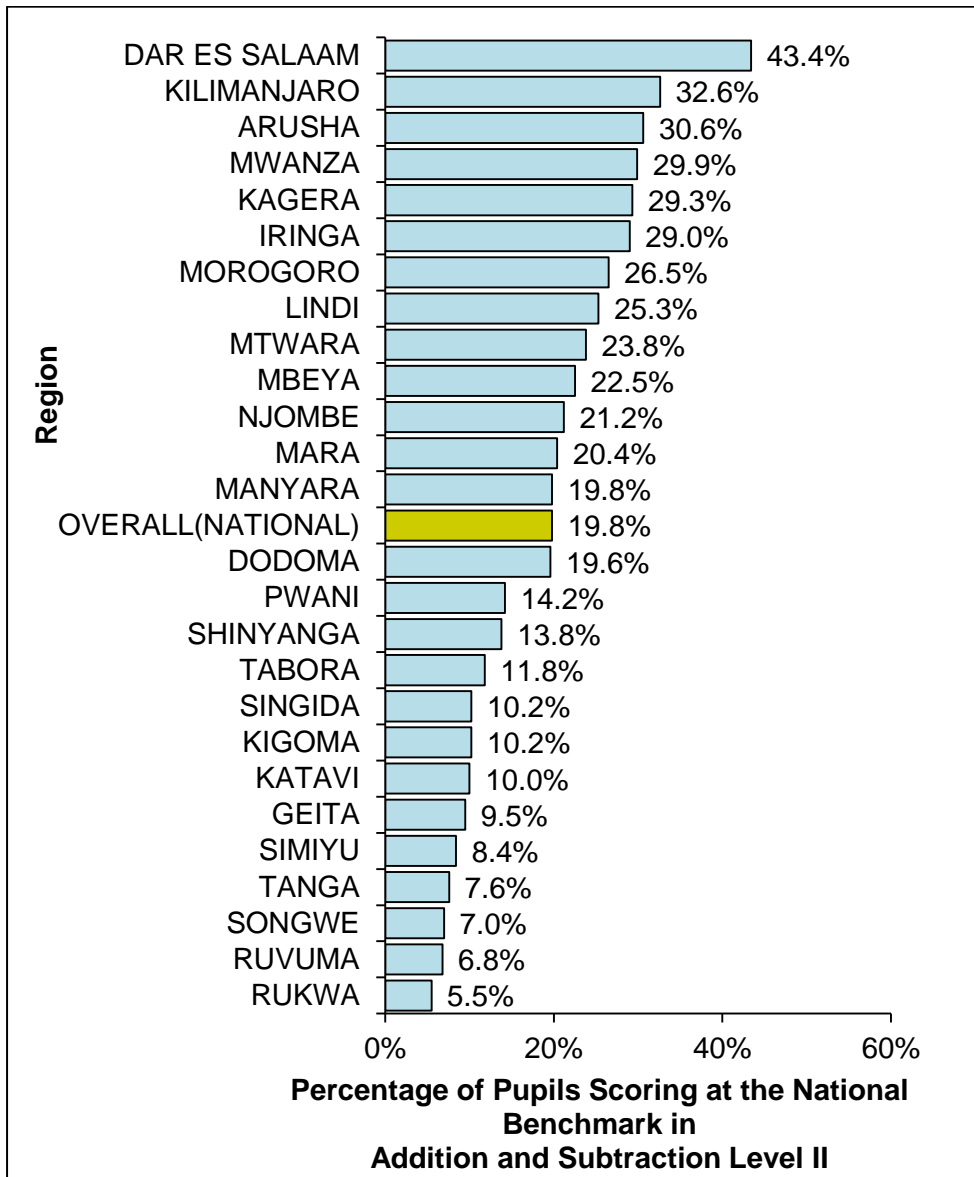
Figure 23: *Proportion of pupils scoring at the national benchmark in Addition and Subtraction Level II*
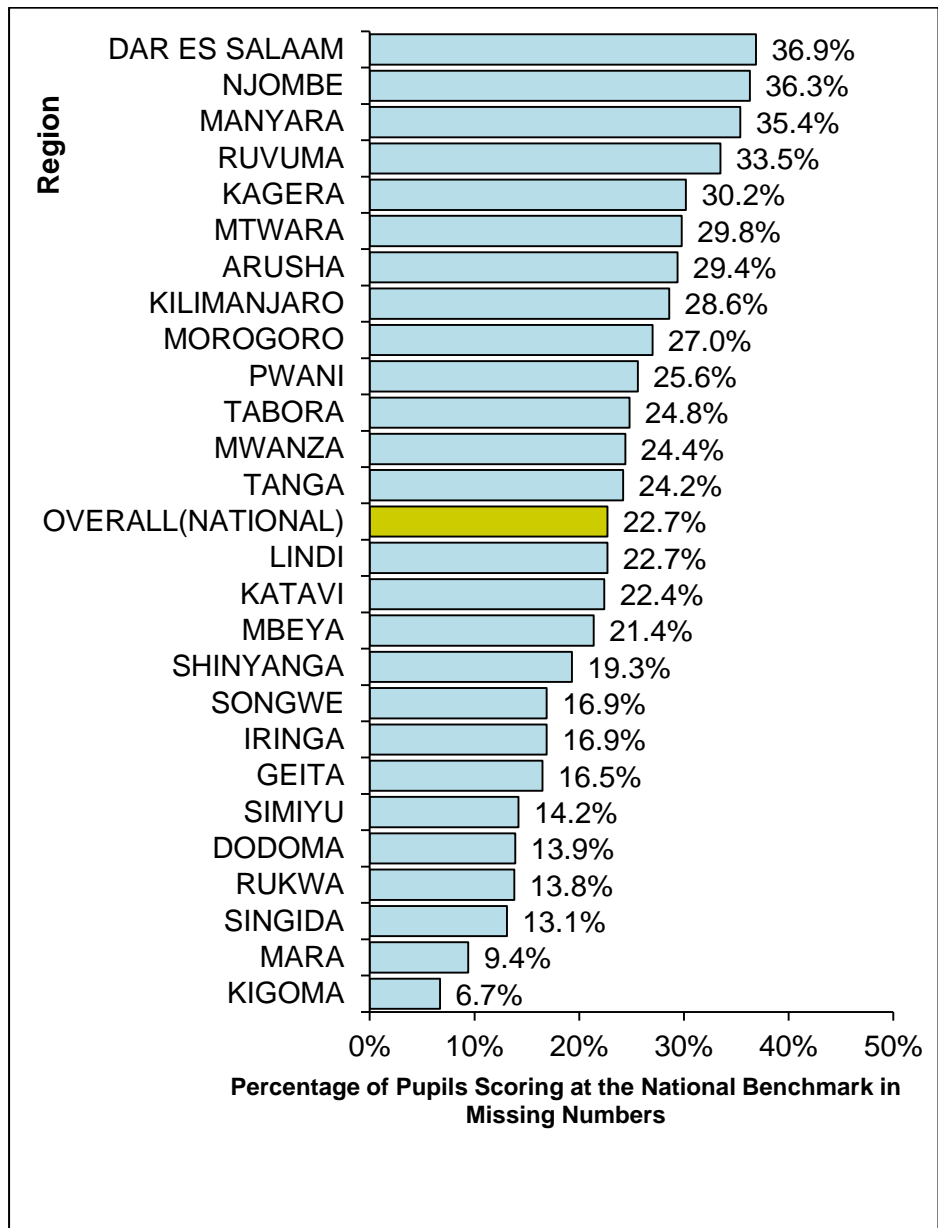
Figure 24: *Proportion of pupils scoring at the national benchmark in Missing Numbers*

Ranked region-wise according to their performance in all three Arithmetic sub-tasks, Dar es Salaam topped the chart of all the tasks. Conversely, Rukwa ranked bottom on the Addition and Subtraction sub-task whereas Kigoma ranked bottom for Missing Numbers and Word Problems sub-tasks. Appendices 3, 4 and 5 present the ranks for Addition and

Subtraction Level II, Missing Numbers and Word Problems sub-tasks. The summaries of percentages for the regional mean scores by gender for Addition and Subtraction Level II, Missing Numbers and Word Problems are presented in Figures 25.1, 25.2 and 25.3.

Regional Performance by Gender in Arithmetic Sub-tasks

Percentage of Regional Mean Scores in Addition & Subtraction Subtask by Gender

Region	Boys	Girls
SONGWE	29.9%	27.9%
SIMIYU	28.3%	27.7%
NJOMBE	43.3%	50.9%
KATAVI	37.1%	32.2%
GEITA	34.2%	34.6%
MANYARA	43.4%	42.0%
TANGA	33.9%	35.2%
TABORA	33.1%	30.8%
SINGIDA	35.1%	34.0%
SHINYANGA	35.9%	32.4%
RUVUMA	33.9%	31.7%
RUKWA	28.3%	28.3%
PWANI	45.8%	47.6%
MWANZA	51.1%	49.3%
MTWARA	48.9%	49.7%
MOROGORO	50.8%	54.0%
MBEYA	46.5%	50.6%
MARA	44.7%	45.1%
LINDI	52.3%	48.3%
KILIMANJARO	53.1%	58.0%
KIGOMA	32.4%	32.3%
KAGERA	52.9%	52.2%
IRINGA	51.0%	54.3%
DODOMA	45.7%	47.0%
DAR ES SALAAM	59.6%	65.9%
ARUSHA	54.0%	51.3%

Figure 25.1: *Pupils' performance on the Addition and Subtraction Level II subtask by region and gender*

61

Percentage of Regional Mean Scores in Missing Number Subtask by Gender

Region	Boys	Girls
SONGWE	22.2%	22.3%
SIMIYU	17.7%	22.3%
NJOMBE	37.7%	43.9%
KATAVI	28.2%	21.6%
GEITA	23.9%	20.1%
MANYARA	41.7%	37.6%
TANGA	33.8%	32.1%
TABORA	30.6%	29.8%
SINGIDA	21.9%	17.9%
SHINYANGA	23.4%	26.1%
RUVUMA	41.0%	32.1%
RUKWA	17.5%	19.8%
PWANI	29.1%	32.8%
MWANZA	29.5%	28.4%
MTWARA	35.3%	38.1%
MOROGORO	31.9%	34.7%
MBEYA	26.9%	32.0%
MARA	17.6%	14.1%
LINDI	30.9%	27.5%
KILIMANJARO	34.9%	40.3%
KIGOMA	12.5%	11.9%
KAGERA	38.0%	31.5%
IRINGA	25.5%	25.4%
DODOMA	24.3%	21.5%
DAR ES SALAAM	46.3%	42.8%
ARUSHA	34.7%	33.7%

Percentage of Pupils

☐ Boys   ☐ Girls

Figure 25.2: *Pupils' performance on the Missing Numbers sub-task by region and gender*
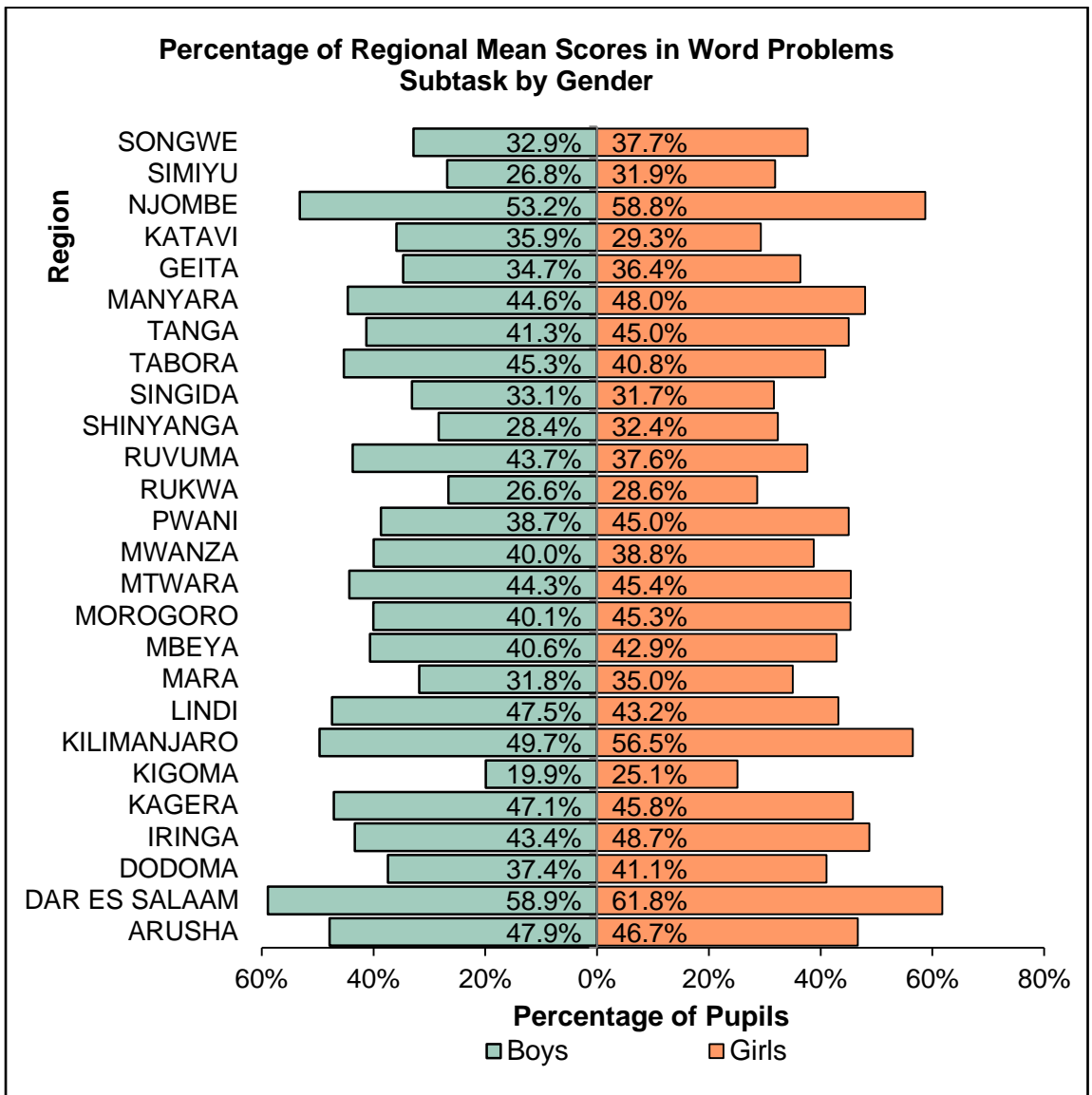
Figure 25.3: *Pupils' performance on the Word Problem sub-task by region and gender*

The comparison between the 2019 and 2021 studies to gauge whether there was an improvement in regional performance for all Arithmetic sub-tasks reveals the highest improvement of performance in Addition and Subtraction Level II for Dar es Salaam with 18.1 percent. On the other hand, Tabora registered the lowest improvement with 0.3 percent. Also,

there was no marked improvement in performance for Missing Numbers in all the regions except for Shinyanga, which registered an improvement of 9.3 percent. Njombe had the highest improvement of performance for Word Problems with 13.33 percent relative to other regions. Meanwhile, Morogoro witnessed a decline of 16.85 percent in the regional disaggregated Words Problems performance.

3.4.8 Analysis of Item Difficulty in Addition and Subtraction Sub-tasks

The analysis of item difficulty aimed to determine the pupils' performance in each item. The items were set in a way that the complexity level increased gradually from the first question to the last one. In fact, the pupils' performance decreased as the level of complexity increased. Moreover, the pupils faced difficulties on items that required adding two double-digit numbers with carrying as the assessment for items 4 and 5 affirm than items that did not require carrying such as items 1, 2 and 3 (Ref. Appendix 18).

For subtraction, a similar trend emerged. In this regard, the pupils found it more difficult to subtract when borrowing as assessed in items 9 and 10 than when subtracting without borrowing as items 6, 7 and 8 illustrate. Moreover, pupils found it more difficult to deal with Subtraction than Addition items. By comparison, the percentages of correct responses for Subtraction items were lower in items with similar level of difficult than for addition items as Figure 26 indicates:

Figure 26 top chart:

Qn.1 7 + 2 =	Qn.2 4 + 15 =	Qn.3 21 + 32 =	Qn.4 39 + 52 =	Qn.5 53 + 27 =
79.8%	64.2%	45.7%	26.9%	23.1%

Addition

Figure 26 bottom chart:

Qn.6 8 - 3 =	Qn.7 18 - 7 =	Qn.8 46 - 32 =	Qn.9 47 - 28 =	Qn.10 60 - 32 =
69.8%	56.3%	33.7%	18.9%	14.8%
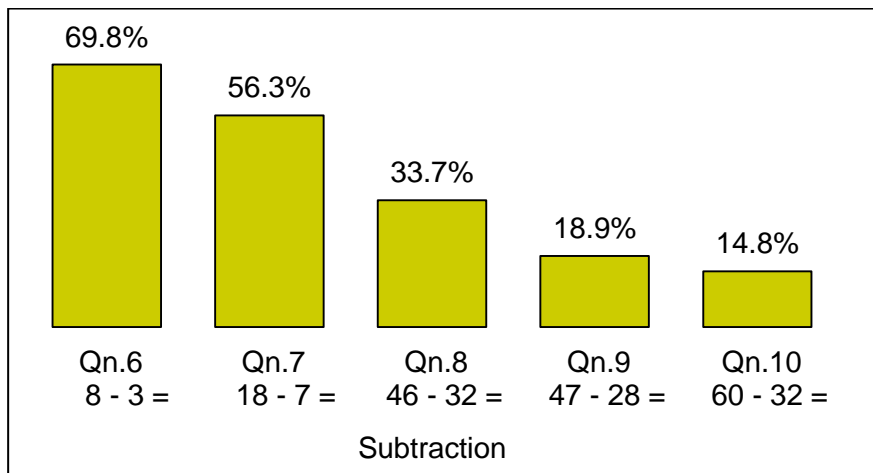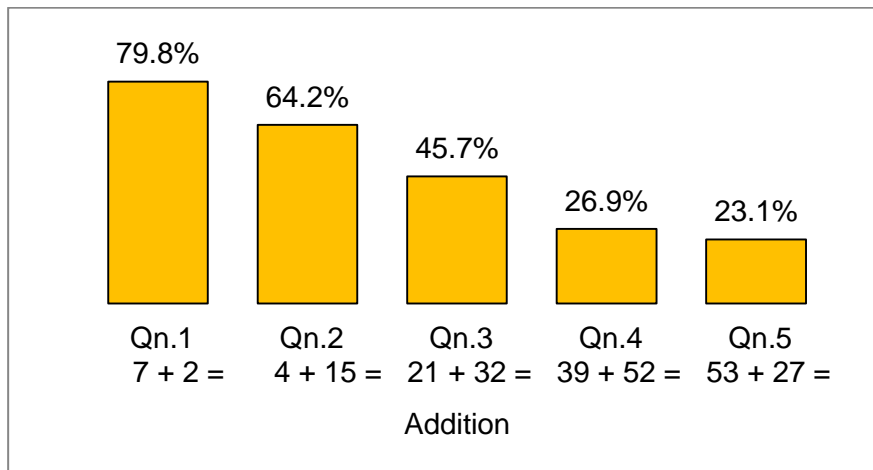
Subtraction

Figure 26: *Percentage of correct pupil's responses to Addition and Subtraction (Level II) sub-tasks.*

3.4.9 Analysis of Item Difficulty for Missing Numbers and Word Problems Sub-tasks

Five items were used to test each of the Missing Number and Word Problems sub-tasks. The assessment for the Missing Numbers was on items 1 to 5 whereas Word Problems were assessed for items 6 to 10. Item 1 required the pupils to decrease 1 in a sequence of numbers, item 2 to increase 2, item 3 to decrease 2, item 4 to increase 5 and item 5 to increase 1. The analysis shows that there was a decrease of percentage of correct responses as the level of complexity

increased. The percentage decreased more on items requiring the pupils to increase by 2, decrease by 2 and increase by 5 than in those which required them to decrease by 1 or increase by 1. Figure 27 provides more illustration:
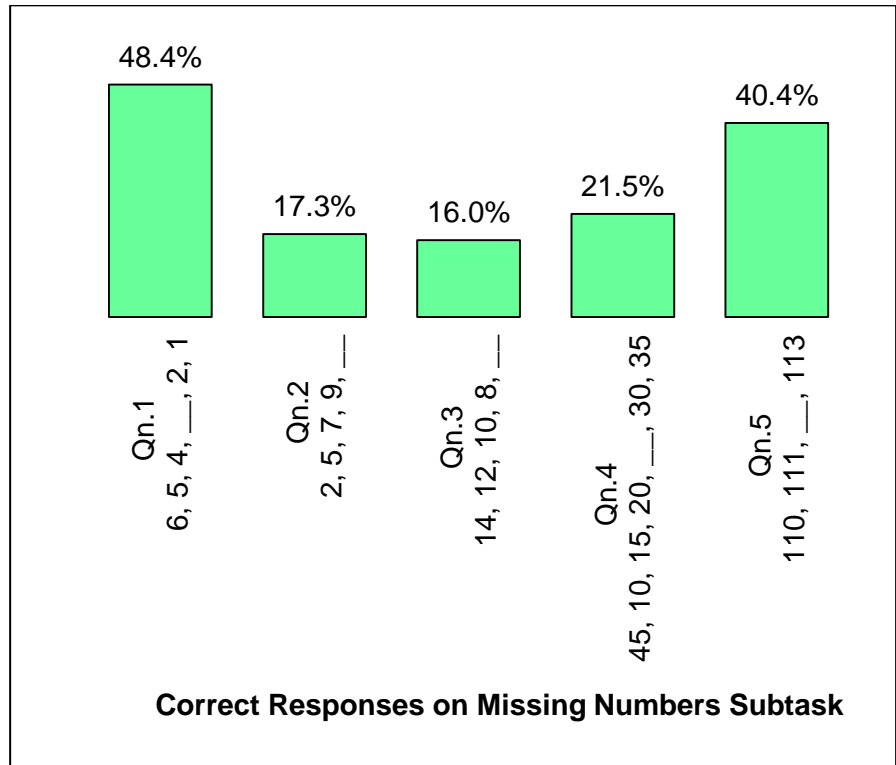
Figure 27: *Percentage of pupils' correct response to the Missing Numbers sub-task*

Moreover, in the Word Problems sub-task, the performance of pupils was higher in items 6 (53.3%) and 7 (57.5%), which were about subtraction and addition of one-by-one digit, respectively. The performance was lower on items that required the pupils to add with carrying (item 9) and subtract with borrowing (item 10), which had 23.0 percent and 15.9 percent, respectively. Figures 27 and 28 illustrate the percentage of correct responses to the Missing Numbers and Word Problem sub-tasks.
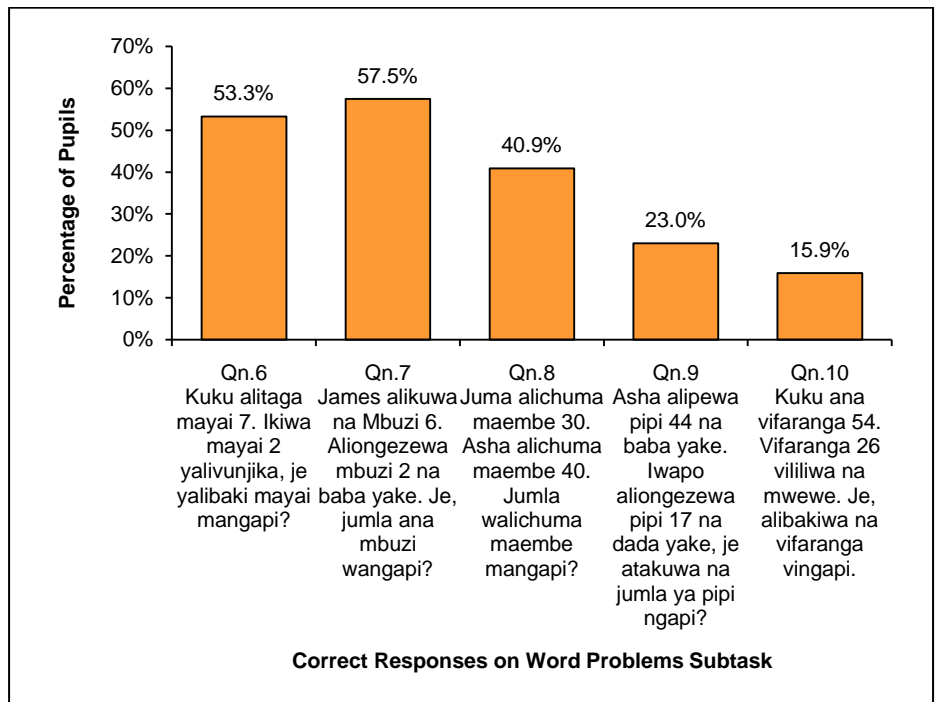
Figure 28: *Percentage of correct responses to the Word Problem Solving sub-task*

As Figure 28 has illustrated, the performance was lower in questions 9 and 10 as compared to questions 6, 7 and 8. Question number 9 required the knowledge of the pupils in addition that involved borrowing. Similarly, for question 10, which pupils performed poorly, the question required the knowledge of subtraction that involved borrowing. Generally, these types of items were challenging to pupils even in the 2019 3Rs study.

When pupils were doing the Addition and Subtraction Level II subtask, they were asked to respond to the items orally and use paper and pencil if they wanted to, though it was not compulsory. Thus, the strategies, which they used by to arrive at their solutions were recorded. It was generally established that paper and pencil method was popular to most of the pupils since 72.0 percent of the pupils used this strategy. On the other hand, tallying was used by 69.0 percent and mental computation was used by only 16.9 percent.

Three strategies have implication for the cognitive level of the pupils in Arithmetic thinking. Among the three strategies (Mental sums, tallying and paper and pencil) mental sum can involve higher mathematical processes as they require procedural knowledge to arrive at the answer. However, this procedural knowledge is applicable without the aid of paper-based visual representation.

The use of paper and pencil, on the other hand, implies a development of mathematical thinking at different levels. Though some used it to develop semi-concrete objects designed to aid them to count, others used them in mathematical procedures such as long addition method and subtraction. The presence of 69 percent of the pupils using tallying means the pupils still depend much on concrete and semi-concrete materials to develop their Arithmetic thinking.

3.5   Writing Skills Assessment Results

Writing skills assessment had three sub-tasks. In the first sub-task, pupils had to deal with 10 pictures and had to write the name for each picture. In the second sub-task, pupils had 10 words written in small letters and had to write them in capital letters. Under the third sub-task, pupils had a passage that required copying and punctuating it by using the four basic punctuation marks, namely full-stop (.), comma (,), exclamation mark (!) and question mark (?). The writing skills assessment results are analysed at the national level, categories of performers based on the ability to write, gender, region and finally rural/urban locality.

3.5.1 National Mean Scores in Writing

The data analysed indicated that pupils performed better in writing words than in the other two sub-tasks when considering the overall national mean scores of each sub-task. The national mean scores in writing words was 51.99 percent. This indicates that pupils managed to write at most 5 words out of 10 words. In changing words written in small letters to capital letters, the mean score was 28.26 percent. This data shows that pupils were able to capitalise 3 out of 10 given words.

Further analysis indicates that in re-writing the passage as well as using appropriate punctuation marks, the mean scores was 32.61 percent. This data showed that pupils copied correctly at most 6 words out of the 16 words forming the passage using appropriate punctuation marks. Table 21 presents the overall national mean scores on each sub-task and the mean scores disaggregated by gender. A further analysis based on gender shows that girls performed better[17] than boys in all the three writing sub-tasks:

Table 21: National Mean Scores on Writing Sub-task

Sub-task	2021 National 3Rs Study		
	Overall National Mean Scores	**Mean Scores by Gender**	
		Boys	**Girls**
Writing Words	51.99% (±0.1)	49.1% (±0.1)	54.7% (±0.1)
Changing words written in small letters into capital letters.	28.26% (±0.1)	26.03% (±0.1)	30.35% (±0.1)
Re-writing a passage using appropriate punctuation	32.61% (±0.1)	30.02% (±0.1)	35.03% (±0.1)

Margin of errors in parentheses ()

---

[17] The study found that girl pupils had a statistically significant better mean percentage scores in Writing Words sub-task (54.70 ± 33.06) than boys (49.10 ± 34.94), t(1731644)=108.511, p=0.00, changing small letters into capital letters (30.35 ± 38.41) compared to boys (26.03 ± 36.63), t(1731644)=75.520, p=0.00 and re-writing a passage using appropriate punctuation (35.03 ± 38.07) compared to boys (30.02 ± 36.40), t(1731644)=88.349, p=0.00.
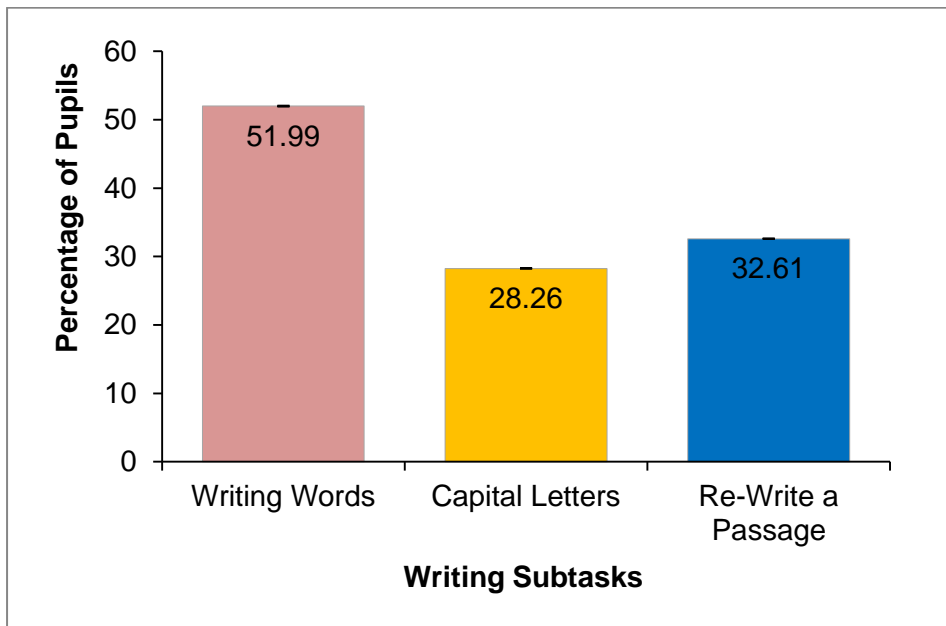
Figure 29: *National mean scores in the writing sub-task.*

3.5.2 Categories of Performers in the Writing Sub-task

The performance of the pupils in the Writing sub-task was classified in four groups Non-performers, Emergent performers, Progressing performers and Proficient performers based on their competencies in the three writing sub-task. The groups of performances are as follows:

(a)   Non-performers – These are pupils who could not write a single word or could write at most 2 words or capitalise at most 2 words and could copy at most 4 words with 1 correct punctuation mark.

(b)   Emergent performers – These are pupils who could write at the most 5 words or capitalise at the most 5 words and could copy at most 8 words with 2 correct punctuation marks.

(c)   Progressing performers – These are pupils who could write at the most 8 words or capitalise at the most 8 words and could copy at most 12 words with 3 correct punctuation marks.

(d)   Proficient performers – These are pupils who could write at most 10 words or capitalise at most 10 words and could copy at most 16 words with 4 correct punctuation marks.

The results on data analysis show that there were more non-performers (36.5%) than there were proficient performers (16.1%). The percentages of pupils in the emergent and progressing categories were 27.4 percent and 20.0 percent, respectively. When the performance of pupils was compared with the results of the 2019 study, the results showed that the percentage of proficient performers decreased by 13.8 percent. On the contrary, the emergent performers increased by 6.7 percent in 2021. Figure 30 illustrates the distribution of the pupils by performance categories:
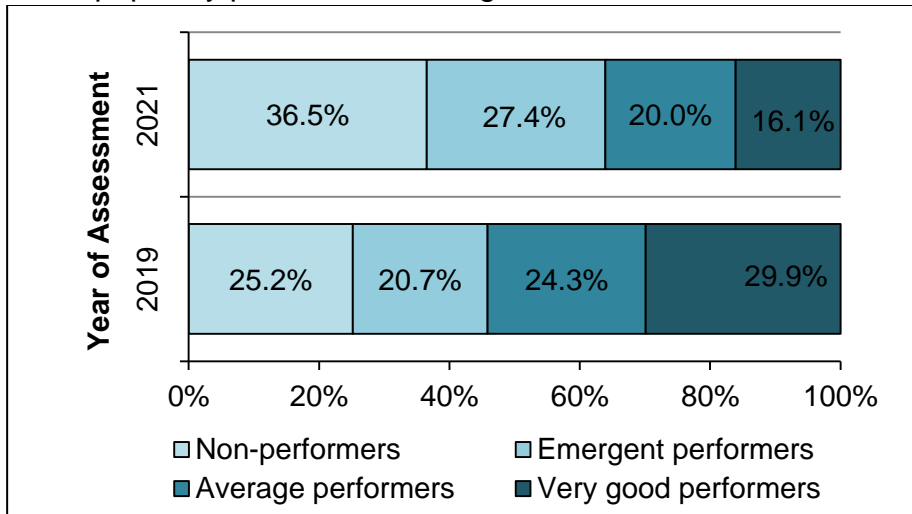
Figure 30: *Categories of performers in the writing subtask.*

The performance of pupils was further analysed gender-wise, with the results showing that, generally, girls out-performed boys in Writing in all categories. In fact, the results indicate a significant difference between the performance of girls and boys by 7.7 percent in the category of non-performers. The

results confirm that girls developed better writing skills than the boys[18] as Figure 31 illustrates:
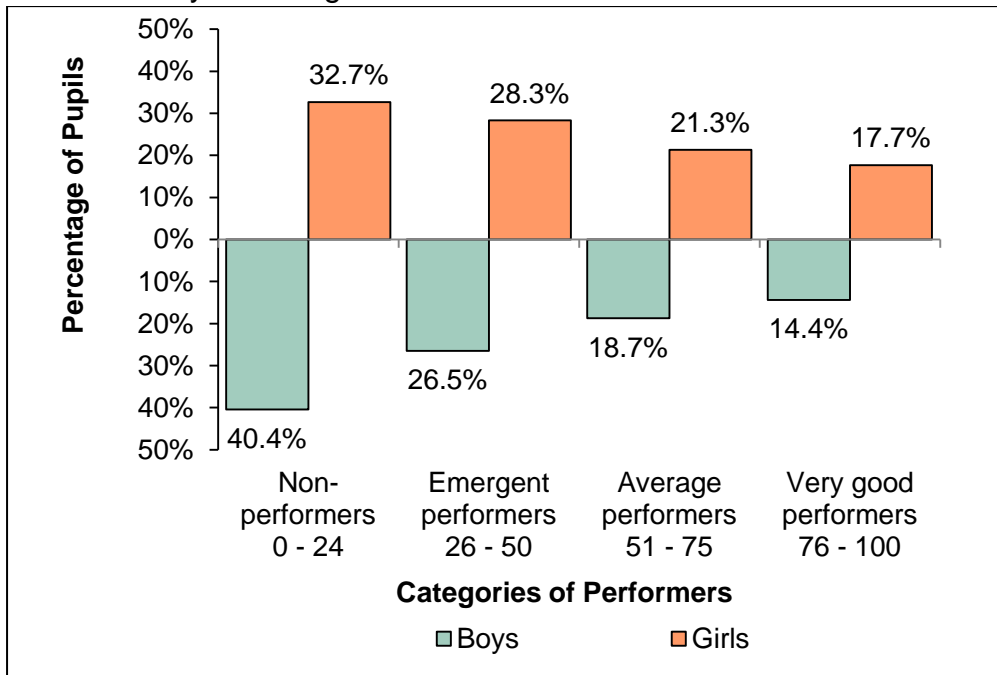
Figure 31: *Distribution of scores on the writing subtask by gender.*

3.5.3 Proportion of Pupils Who Scored Zero in Writing Skills

The national mean score of the pupils, who scored zero in the Writing sub-task was 14.5 percent (±0.1). When compared to 2019 the mean scores of pupils with zero score increased by 6.8 percent in 2021. The performance of pupils was further disaggregated by gender and it was established that, more boys (16.9%; ±0.1) scored zero in the Writing Assessment sub-task than girls (12.2%; ±0.1) as Table 22 illustrates:

Table 22: Percentage of Zero Scores for the Writing Sub-task

---

[18] The results indicate a statistically significant difference between performers in writing skill, x2(3, 1731646) =11847.088, p=.00. This means that more appealing performers were dominantly girls.

72

	2019 National 3R's Study			2021 National 3R's Study		
Description	National Mean Score	Boys	Girls	National Mean Score	Boys	Girls
Percentage of zero scores at the Writing Subtask	7.7% (±0.1)	8.7% (±0.1)	6.8% (±0.0)	14.5% (±0.1)	16.9% (±0.1)	12.2% (±(0.1)

Margin of errors in parentheses ()

3.5.4 Distribution of Scores in Writing Sub-tasks

More pupils (71.0%) had poor performance in the Word writing sub-task. They hardly wrote 2 words correctly (correct names representing the pictures) out of 10 words. Another 26.6 percent of the pupils managed to write 6 to 10 words. In other words, they had good writing skills as Figure 32 illustrates:
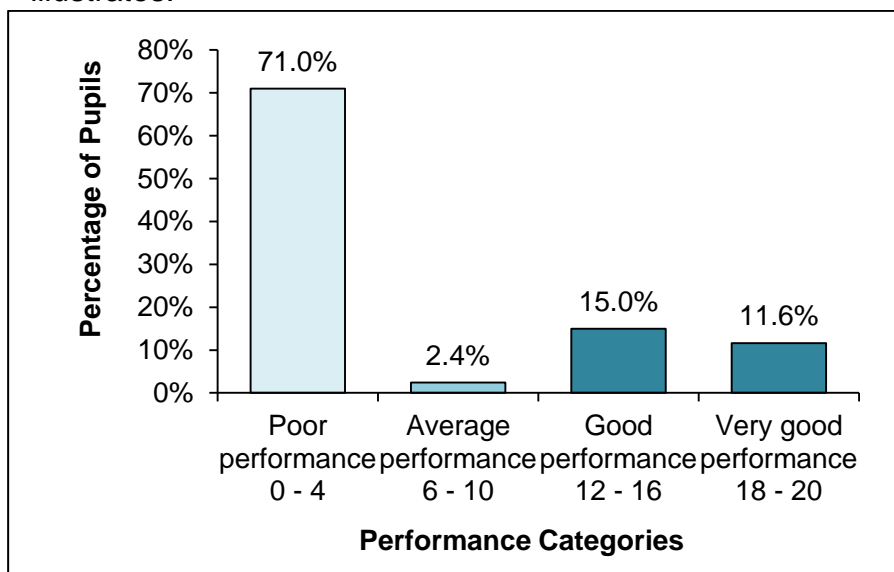
Figure 32: *Distribution of pupils' score in the word writing sub-task*

In the second sub-task where pupils were required to change words written in small letters to capital letters, results indicated that, most pupils (63.6%) had inadequate performance. Only a few pupils attained good performances

and very good performance (26.6%). The performance of pupils was not normally distributed as Figure 33 illustrates:
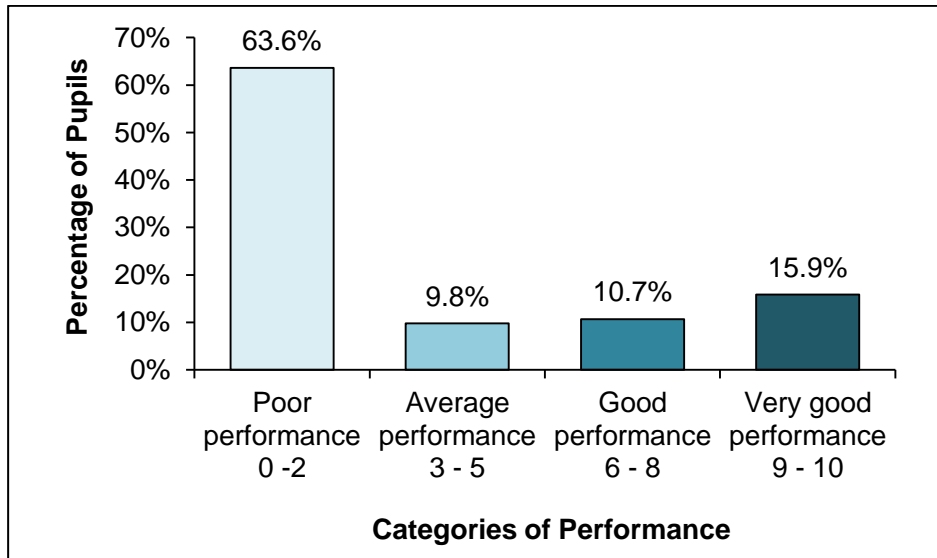
Figure 33: *Distribution of pupils' scores in the sub-task of changing small letters into capital letters.*

Statistics show that on the sub-task that required the pupils to re-write a passage and use appropriate punctuation marks, pupils had poor performance. The pupils copied at the most 4 words and use appropriately 1 punctuation mark (60.3%). On the other hand, 33.9 percent of the pupils could re-write 12-16 words and use appropriately 3 to 4 punctuation marks. Figure 34 shows the distribution of scores for this sub-task:
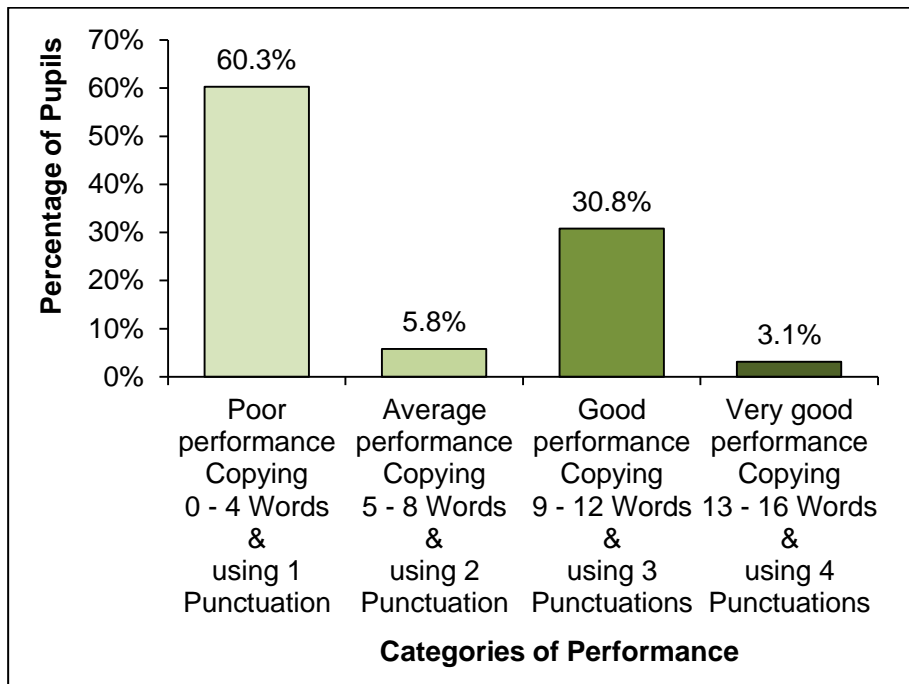
Figure 34: *Distribution of scores in re-writing a passage and using appropriate punctuation marks.*

3.5.5 Distribution of Scores in Writing Sub-tasks by Gender

Further analysis on the distribution of scores in the Writing subtasks by gender revealed that the performance of girls was higher than that of boys in the Word Writing sub-task. Both groups had many pupils with poor performance (68.8% girls and 73.4% boys). The data reveal that there is a tendency toward lower performance compared to the 2019 3Rs study. The girls who had higher scores in Words Writing in 2019 accounted for 61.2 percent whereas boys registered 55.1 percent compared to 28.9 percent and 24.1 percent, respectively, in the 2021 3Rs study. Figure 35 presents the distribution of scores on the Writing subtask:
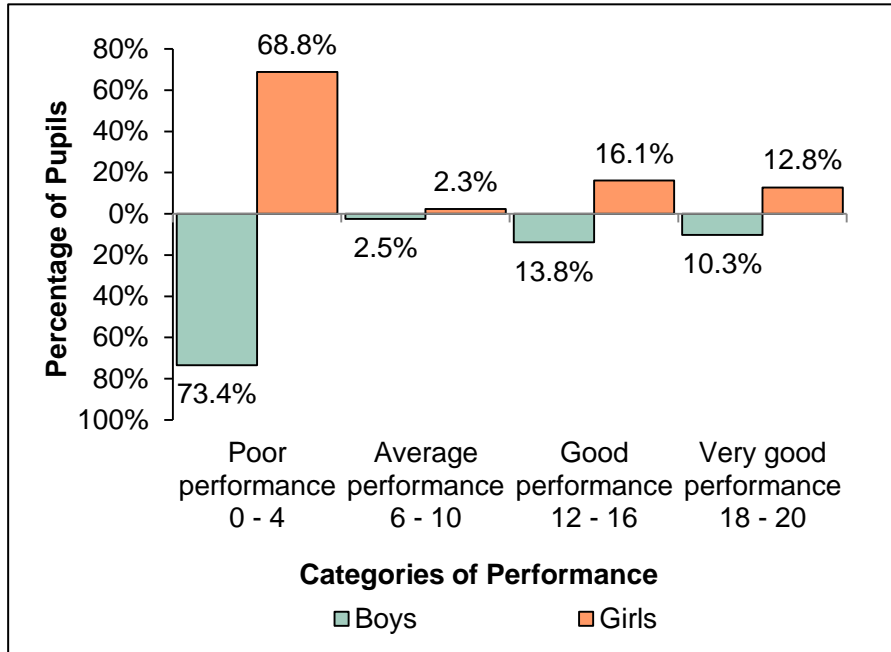
Figure 35: *Performance on the word writing sub-task by gender.*

Analysis of data to determine the performance of boys and girls in the task of capitalising small letters revealed a persistent prevalence of lower achievers in both groups (61.1% girls and 66.4% boys). Yet, girls (28.9%) performed better (had good and very good performance) than boys (24.2%) with similar performance. In this sub-task too, the performance of girls was more statistically significant than that of boys[19] as illustrated in Figure 36:

---

[19] There is a statistically significant difference in the distribution of scores in capitalising small letters x2(3, 1731646) =5620.218, p=.00. This means that the distribution of scores for girls were more appealing in contrast to that of boys.
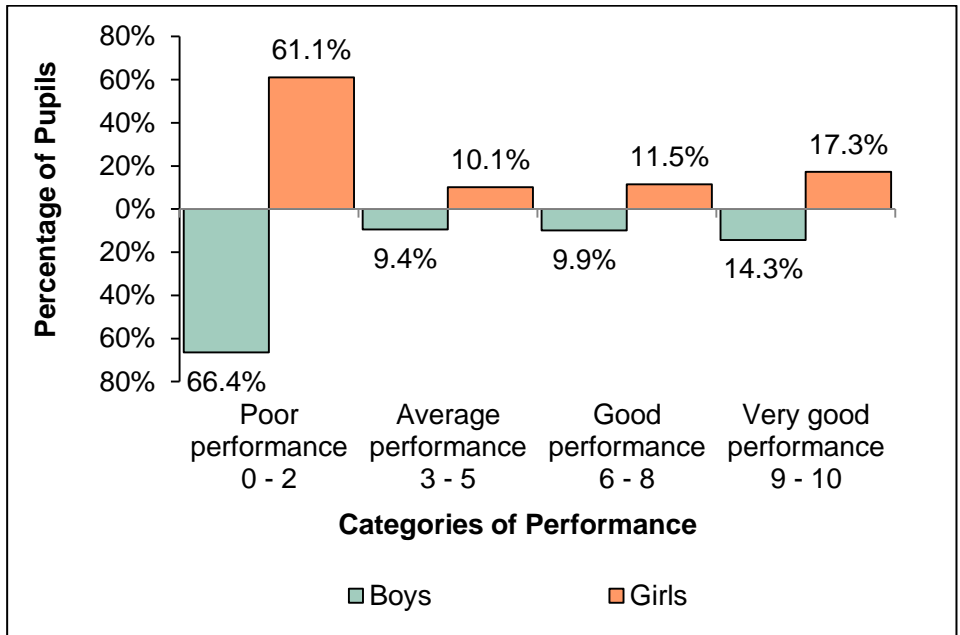
Figure 36: *Percentage of pupils' performance on the task of capitalising small letters by gender.*
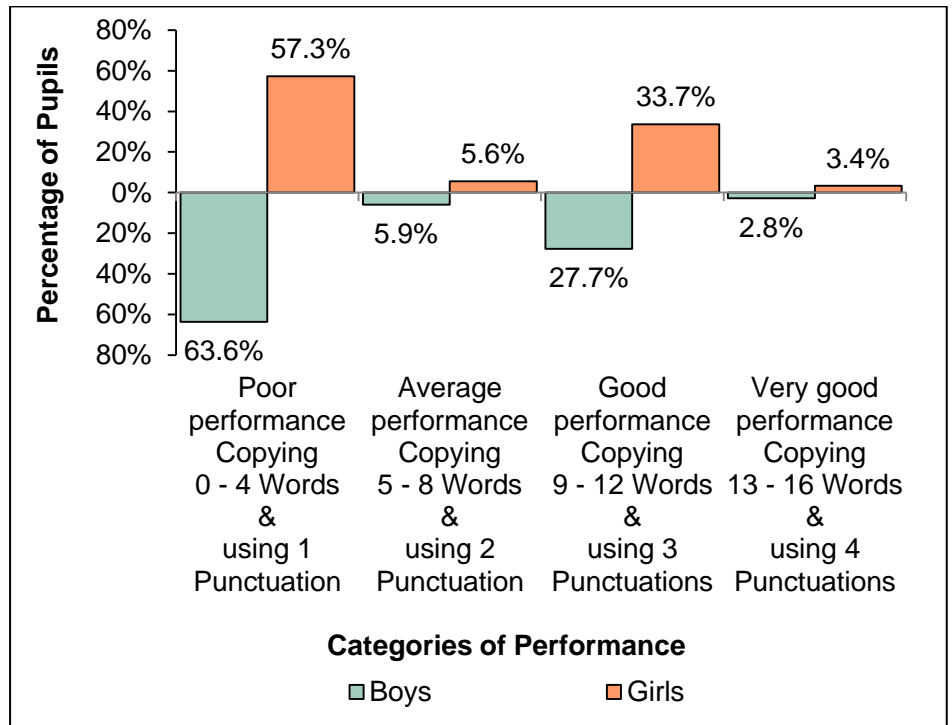
Figure 37: *Distribution of score in the sub-task that required pupils to rewrite a passage and use appropriate punctuation marks.*

77

3.5.6 Pupils' Performance in Writing Assessment by Region

Analysis to determine the pupils' performance at the regional level on Writing Skills shows that 13 regions performed above the national mean percentage scores (39.5%). Dar es Salaam had the highest proportion of pupils whose performance attained the national mean score (39.5%) whereas Simiyu had the lowest proportion (24.1%) as illustrated in Figure 38:
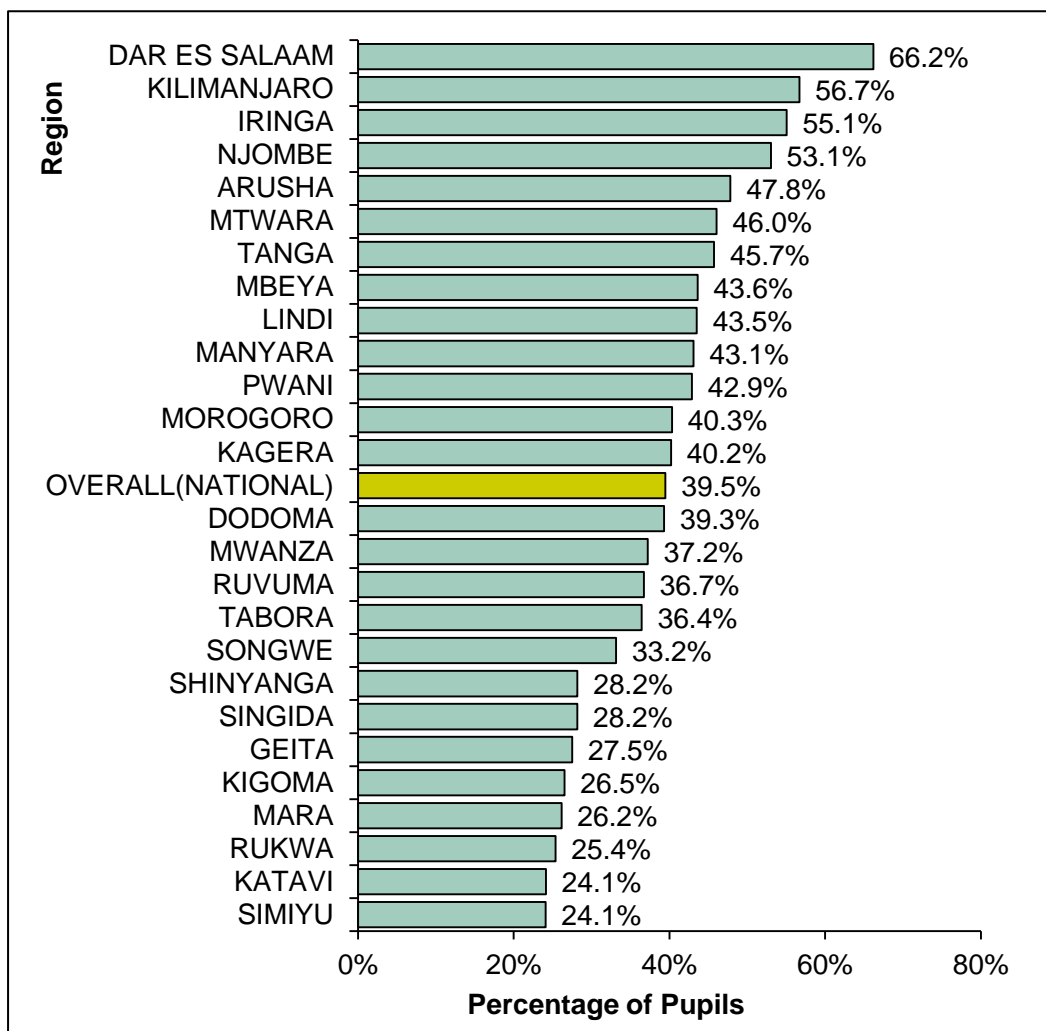
Figure 38: *Mean scores in the writing subtask by region.*

Further analysis to compare the performance of pupils based on gender show that girls outperformed boys in Writing Skills in all the regions except in Katavi region where boys had a better performance. Figure 39 illustrates regional performance in Writing Skills by gender:

Percentage of Regional Mean Scores in Writing by Gender

Region	Boys	Girls
SONGWE	29.4%	36.6%
SIMIYU	21.0%	27.0%
NJOMBE	46.2%	58.9%
KATAVI	24.3%	24.0%
GEITA	25.7%	29.5%
MANYARA	39.6%	46.9%
TANGA	41.0%	50.5%
TABORA	34.8%	37.9%
SINGIDA	25.5%	31.0%
SHINYANGA	25.4%	30.9%
RUVUMA	36.3%	37.1%
RUKWA	24.3%	26.4%
PWANI	39.1%	46.5%
MWANZA	36.8%	37.6%
MTWARA	44.2%	48.0%
MOROGORO	36.9%	43.4%
MBEYA	41.0%	46.3%
MARA	25.6%	26.6%
LINDI	42.2%	44.8%
KILIMANJARO	51.7%	61.7%
KIGOMA	23.8%	29.2%
KAGERA	38.4%	41.9%
IRINGA	50.4%	59.2%
DODOMA	35.8%	42.7%
DAR ES SALAAM	63.2%	68.7%
ARUSHA	45.6%	50.1%

Percentage of Pupils
☐ Boys   ☐ Girls

Figure 39: *Distribution of scores in writing subtask by gender.*

3.5.7 Analysis of Item Difficulty in the Writing Skills Sub-task

Analysis of item difficulty in writing for all the three sub-tasks show that in writing word subtask, more pupils experienced

difficulties in writing two words *baiskeli (77.4%)* and *pundamilia (66.8%)* than the other words. The word *chanuo* was also relatively difficult as the scores of 58.3 percent of the pupils indicate. Generally, the performance of pupils in the Writing Skill was average as most of them could write at the most 6 words out of 10 correctly. Figure 40 further illustrates:
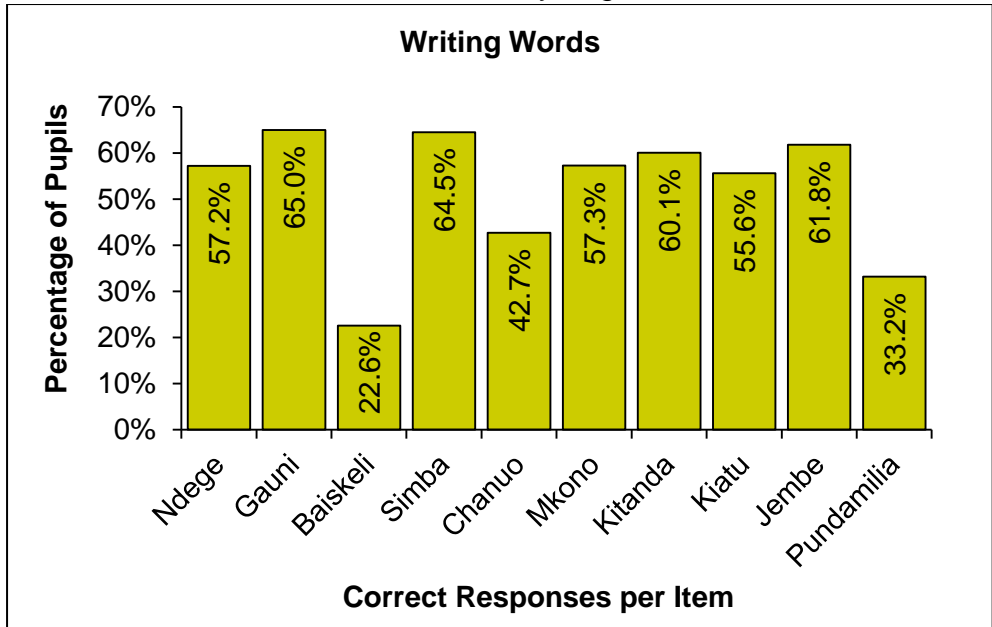
Writing Words

Figure 40: *Percentages of pupils who wrote words correctly in the words writing subtask.*

Further analysis on the second sub-task of capitalising words shows that there was no significant difference among the 10 words. The pupils' performance ranged from 23.2 to 35.8 percent. In other words, the general performance in this sub-task was low, as Figure 41 illustrates:
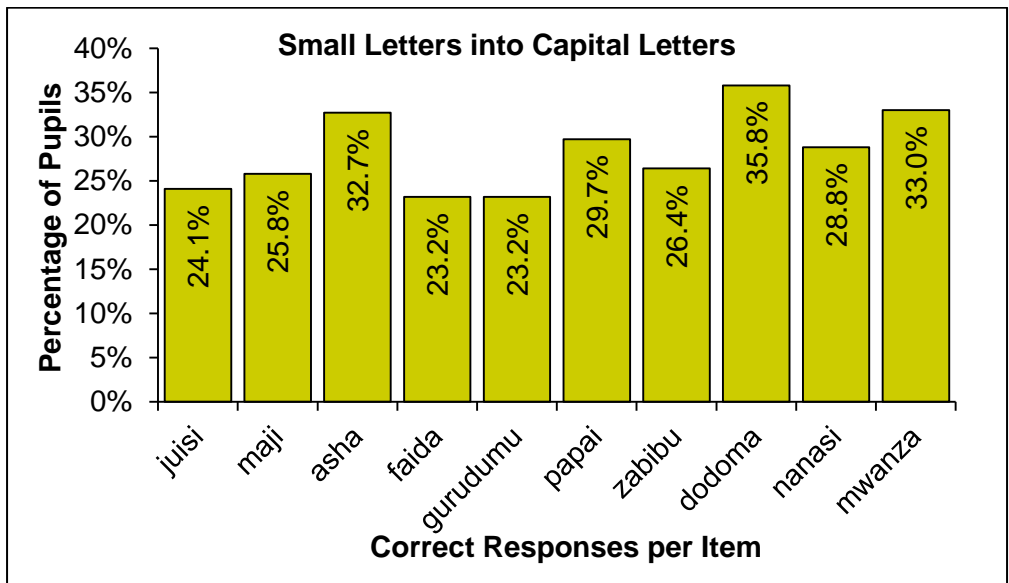
Figure 41: *Percentage of correct responses in underlining small lettered words.*

For the third sub-task, the pupils had to rewrite the passage and use correct punctuation marks. The pupils managed to rewrite the words in the passage; however, they faced difficulties in using correct punctuation marks. The data shows that only 7.7 pupils used a full-stop correctly; 9.3 percent used the exclamation mark as required; 11.4 percent used the comma; and 12.1 percent used the question mark correctly. Apparently, the pupils' inadequate competencies in using the basic punctuation marks as illustrated in Figure 42:

Copying and Re-write the Passage using appropriate Punctuations
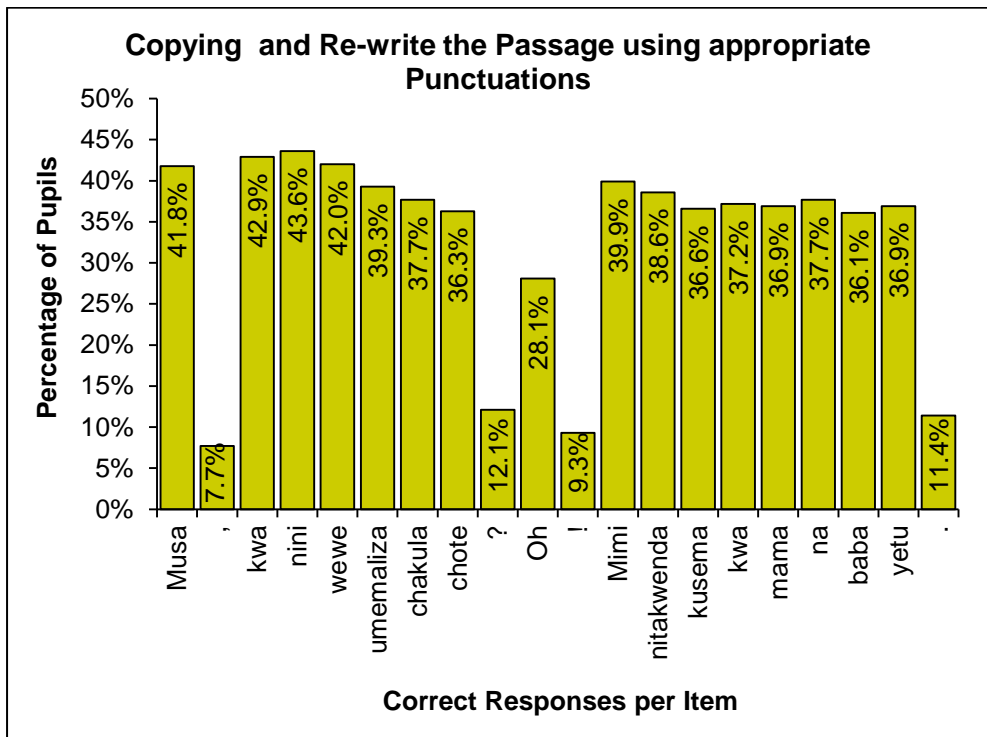
Figure 42: *Pupils' percentage of correct rewriting and punctuatiion*

3.5.8 Overall Regional Rank on the 2021 3Rs Study

The overall regional rank in Reading, Arithmetic and Writing skills was computed using mean scores for each skill in each region to determine the regions, which had better performance than the others in all the skills. Appendix 17 depicts the overall ranking for all the skills, which were assessed in the 2021 3Rs study. The overall ranking and revealed that the top five best performing regions were Dar es Salaam, Kilimanjaro, Njombe, Iringa and Arusha whereas the least five performing region were Kigoma, Rukwa, Simiyu, Katavi and Shinyanga. Uniquely, Dar es Salaam region had the best performance in all the 3Rs skills in the assessment.

3.6 Teaching and Learning Inputs

For effective learning to take place inputs to the system is one of the ingredients. Learning inputs can include things such as the presence of textbooks in schools, teaching and learning materials such as writing boards and a supportive infrastructure such as the presence of

desks and good classrooms. To collect such information, the questionnaires were administered with head teachers and invigilators for them to provide information on their schools. The goal was to paint a composite picture on the state of learning inputs likely to engender success.

3.6.1 Availability of Teaching and Learning Resources

Factors that influence effective classroom instructions culminating in the desired academic performance are textbooks, supplementary books and other supportive resources in schools. Data were collected from the heads of school using questionnaires to assess the teaching and learning environment. The information required was on teaching and learning resources for the 3Rs and the overall teaching and learning environment. Table 23 shows the status of the availability of learning resources:

Table 23: Availability of Teaching and Learning Resources

S/N	Item	Poor (%)	Average (%)	Good (%)	Very Good (%)	Total No. of respondents	Total% (Average to Very good)
(i)	Availability of textbooks for teaching Arithmetic skills	11.43	47.61	34.51	2.08	481	84.20
(ii)	Availability of supplementary books for teaching Arithmetic skills	18.46	44.19	26.76	2.90	482	73.85
(iii)	Presence of resources for teaching and learning arithmetic skills (such as counting aids) and other resources	10.08	35.5	43.49	5.88	476	84.87
(iv)	Presence of materials for teaching Writing skills (such as writing boards and other resources)	19.33	39.5	25.36	3.74	481	68.60
(v)	Availability of textbooks for teaching Reading skills	13.92	42.83	33.12	5.70	474	81.65
(vi)	Availability of materials aimed at developing pupils' reading skills such as short story books.	10.58	28.22	40.46	17.63	482	86.31

Table 23 indicates that 481 participants responded on the availability of textbooks for teaching Arithmetic Skills. Among them, 47.61 percent said the availability was average whereas 34.51 percent said there was a good availability of textbooks. The respondents who said the availability of textbooks for teaching Arithmetic Skills was very good were very few (2.08%). Under this category, only 11.43 percent indicated poor availability of the textbooks. The data presented shows that there is generally a good supply of textbooks for teaching Arithmetic Skills as 84.20 percent of the responses affirm.

The respondents, who indicated average availability of supplementary books for teaching Arithmetic Skills, represented 44.19 percent. On the other hand, 26.76 percent acknowledged that there was good availability of supplementary books. Very few (2.90%) said the availability was very good. Those who said the availability was poor accounted for only 18.46 percent. This analysis indicates that, the supply of supplementary books was supported by 73.85 percent of the respondents.

Data was also collected on tools such as counting aids for teaching Arithmetic Skills. The data captured indicate that tools such as counting aids for teaching Arithmetic Skills was supported by 84.87 percent of the respondents. Moreover, the data indicates that the supply of textbooks for teaching Reading Skills was good in the schools under reviews as supported by 81.65 percent of the respondents.

Further analysis shows that the presence of reading books such as short story books for teaching Reading Skills was good (86.31%).

3.6.2 Teaching and Learning Environment

During data collection, the heads of school were further asked about the state of the general teaching and learning environment, including the availability of desks, tables and

chairs for pupils and teachers, classrooms and drinking water and sanitation. Table 24 presents the responses of heads of schools.

Table 24: Status of Teaching and Learning Environment

S/N	Item	Poor (%)	Average (%)	Good (%)	Very Good (%)	Total No. of respondents	Total% Average to Very good
(i)	Availability of desks, tables and chairs for pupils and teachers.	15.96	39.41	36.48	6.19	307	82.08
(ii)	Adequacy of classrooms relative to number of pupils in Standard I and II .	19.68	35.81	31.94	5.16	310	72.91
(iii)	Availability of water sources for the pupils to drink and sanitation	19.54	28.66	34.85	9.12	307	72.63

Table 24 indicates that 39.41 percent of the respondents rated the availability of desks, tables and chairs for pupils and teachers as average whereas 36.48 percent indicated it as good. The respondents, who said the availability was very good, represented only 6.19 percent of the sample. In contrast, 15.96 percent of the respondents said the availability was poor. Generally, the availability of desks, tables and chairs for pupils and teachers was good as reported by 82.08 percent.

Further analysis shows that the availability of adequate classrooms relative to number of pupils in Standard I and II was at 72.91 percent as reported by 310 heads of school.

On the availability of water sources for the pupils to drink and sanitation, 34.85 percent of the respondents acknowledged that there was a good supply of water sources whereas 28.66 percent said it was average. The respondents, who said the supply was very good, represented 9.12 percent. On the other hand, 19.54 percent confirmed that the availability of water sources and sanitation was generally poor in schools.

3.6.3 Factors Affecting the Teaching and Learning of 3Rs

The question on challenges that hinder the process of teaching and learning of the 3Rs was posed to the heads of school. Their list of the options included distance, absenteeism, pupil-teacher ratio, receiving incompetent pupils in 3Rs from other schools and shortage of teaching and learning materials. Table 25 summarises the results:

Table 25: Factors Affecting Teaching and Learning of 3Rs skills

S/N	Item	Number	%
(i)	Walking distance from home to school	173	33.7
(ii)	Unsatisfactory school attendance	159	30.9
(iii)	Shortage of 3R teachers	213	41.4
(iv)	Receiving pupils with poor 3R skills transferred from other schools	148	28.8
(v)	Shortage of teaching and learning materials like books	194	37.7
(vi)	Other factors	351	68

N = 514

Table 25 indicates that the shortage of the 3Rs teachers constituted a major challenge that affect teaching and learning of 3Rs in schools. The heads of school pointed out shortage of teaching and learning materials to be the second problem that faces the field whereas walking distance from home to school seemed to be the third barrier to teaching and learning of 3Rs. The fourth challenge was unsatisfactory school attendance as the number of pupils missing lessons was significant. The fifth hindrance to teaching and learning of 3Rs received pupils with poor 3Rs skills transferred from other schools.

The respondents also pointed out other factors that affected the teaching and learning, which were not specified in the questionnaire. Such factors include parents shifting settlements which necessitate pupils to leave school, failure of parents to fulfil their responsibilities in taking care of the

pupils, poor living standards, and lack of feeding programmes in schools.

CHAPTER FOUR
CONCLUSION AND RECOMMENDATIONS

4.1   Conclusion

Generally, the objectives of the 2021 3Rs study were achieved. When compared to the 2019 3Rs study, the findings depict progress in all the three skills. Also, the analysis portrays some persistent trends, which may require pedagogical interventions. The overall performance shows that the pupils' performance was relatively low in Writing Skill assessment as compared to the Reading Skill and Arithmetic assessment results.

As far as Reading Skill assessment is concerned, the findings indicate a decreasing trend in the lower groups (non-readers and beginning readers). The trend shows a shift towards progressing readers. These trends indicate that the effort to improve teaching and learning of the Reading Skills is steadily improving. Similarly, trends in Arithmetic Skill assessment indicate improvement. Overall, the percentages of pupils scoring at the national benchmark is steadily increasing.

Conversely, the proportion of pupils scoring zero is also decreasing. Yet, there are pedagogical issues that need addressing particularly on the pupils' ability to handle Addition and Subtraction Level II and Missing Numbers. Even though progress is detected in Reading and Arithmetic Skills, the results indicate a decline in the performance of pupils in Writing Skills when compared to the 2019 3Rs assessment. Likewise, the findings show some persistent issues regarding Writing Skills, which have pedagogical implications. Like in the 2019 study, pupils performed poorly in using appropriate punctuation and capitalisation. This problem might require pedagogical intervention aimed to improve pupils' learning in these areas. However, there was generally an increase in the pupils' enrolment, particularly following the Fee-Free Basic Education (FFBE). This rapid development could explain reason behind the slow pace detected in the improvement in the 3Rs skills.

Gender-wise, the study findings signal the emergence of some gender imbalance. Specifically, the results in all the 3Rs skills indicate

that girls performed significantly better than boys. The differences in all the three skills were statistically significant. This challenge requires more investigation to determine the reasons behind its emergence in a bid to devise measures to address it.

The analysis of data based on locality also indicate that urgent measures are required because the study has exposed variation in performances between rural and urban based pupils. The findings also show that pupils from urban areas performed better in all the three skills than pupils from rural-based schools.

The comparison of findings, which was done between the 2019 3Rs study and the 2021 3Rs study, signals some persistence of issues that need pedagogical interventions. For Reading Skills assessment, for example, even though Oral Reading speed in Correct Words Per Minute (CWPM) was found to be steadily improving, reading for comprehension also needs further encouragement. Lower scores in RC imply that many pupils who can read some words cannot interpret what they read. Such pupils cannot use reading to learn.

Similar reading issues had been identified in the previous studies particularly the 2019 3Rs study; yet they persist in the 2021 3Rs study. One of the issues which was identified in the 2019 3Rs study was the challenge of reading nasal sound words and words with consonant clusters. Though this problem was also noted in the 2019 3Rs study, it was also prevalent in the 2021 3Rs study.

In Arithmetic Skills, the results show that pupils performed well on the items that did not require borrowing in Subtraction or carrying in Addition in level II. However, they contended with challenges when it came to addition and subtraction level II that requires addition of numbers while carrying or subtracting numbers, which involves borrowing. However, 40.1 percent of pupils scored zero in missing numbers. These are pedagogical issues that call for an immediate intervention.

In the writing assessment, the results also reveal similar trends. The study found that pupils experienced difficulties in using punctuation marks in the 2019 study. Similar findings were also evident during the

2021 3Rs study. Indeed, many pupils found it increasingly difficult to rewrite and use appropriate punctuation marks during the study.

4.2 Recommendations

Based on the findings of this study, the following recommendations are made:

(i)   It has been found that reading develops from as low as sound association with the alphabet of the language to as complex as reading words, sentences and phrases. All these skills, however, develop with frequent exposure to the text. It is therefore recommended that to improve the ability of pupils to read and use reading to learn, they should be guided to read short stories appropriate to their level.

(ii)   The findings have revealed a recurrent trend of pupils facing challenges in performing addition items that requires carrying and subtraction items that requires borrowing. It was also noted that pupils had challenges in handling Missing Numbers. The persistent nature of these issues implies correlation with how the skills are taught and learned. Therefore, it is suggested that respective authorities such as school quality assurers and curriculum developers and assessors should investigate the reasons behind the continuing trend of pupils performing poorly in these areas in a bid to improve teaching and learning.

(iii)   The Addition and Subtraction Level II items consisted of main one-digit and two-digit numbers. The progression of the items started from simple items to items that required borrowing in subtraction and carrying in addition. Yet, only 16.9 percent of the pupils used mental strategies in summing the items, which implies that they still rely on concrete objects in applying their mathematical knowledge. Nevertheless, the expectation was that by the end of Standard II most of the pupils should have applied the mental sums strategy to respond to most of the items. Thus, teachers should engage the pupils in mental computation of Addition and Subtraction Level I during teaching and learning and emphasise on the concept of bridging. The teaching should also use concrete objects as a means for

fostering conceptual development and moving gradually to applying mathematical rules through mental computation.

(iv) The findings on Writing Skills also show that the issues, which were detected in 2019 also materialised in the 2021 study. Pupils faced challenges when using punctuation marks appropriately and capitalising words. As such, pupils should be exposed more to writing activities beyond learning formation of letters, words and sentences; and using writing to compose their own writing while using appropriate punctuation and capitalisation.

(v) As far as gender is concerned, it was found that in both studies the girls performed significantly better than boys. The normal trend, which was seen earlier, is for girls to do better in some skills and boys in some other skills. Since the purpose of the nation is to eliminate gender imbalance, there is a need for respective authorities to investigate why girls outperform boys in some respects, which could further bring about gender disparity in future.

(vi) The study also found that locality matters in terms of pupils' performance in the three skills. Specifically, pupils from urban based schools are more likely to perform better than those in rural areas in similar levels. Since, as a nation, equality in all settings is encouraged, the reasons inducing this trend need further investigating and be addressed accordingly so that performance is not affected by a person's locality.

References

Alvarez-Canizo, M., Suarez-Coalla, P. and Cuetoz, F. (2015). The role of Reading Fluency in Children Text Comprehension. *Frontiers in Psychology. Doi 10.3389/fpsyg.2015.01910.*

Bigozzi L., Tarchi C., Vagnoli L., Valent E., and Pinto G. (2017). Reading Fluency as a predictor of school outcome across Grade 4 – 9.

Chambers F. (1997). What do we mean by Fluency? System 25 5535 – 544. 10.1016/s 0346-251x (97)0046-8

Elhassan, Z., Crewther, S. G., Bavin, E. L. and Crewther, D. P. (2015). Preliminary Validation of FastaReada as a Measure of reading Fluency. Frontiers in Psychology. Pp 1 -9

Goves, A. and A Wetterberg (EDs) (2011). The Early Grade Reading Assessment: Applications and Intervention to improve Basic Literacy. Reaserch Triangle Park, N. C Research Triangle Institute.

McCutchen, D., Green L., Abbott R. D. and Sanders E. A (2009) Further evidence for Teachers Knowledge: Supporting Struggling readers in Grade three through five. Doi 10.1007/s11145-9163-0.

Mazana M. Y., Montero C. S and Casmir R. O. (2020). Assessing Students' Performance in Mathematics in Tanzania: The Teacher's Perspective. *International Electronic Journal of Mathematics Education e-ISSN: 1306-3030. 2020, Vol. 15, No. 3, em0589 https://doi.org/10.29333/iejme/7994.*

Memisevic H., Biscevic I. and Pasalic A. (2018) *Predictors Of Math Achievement In Elementary School Students* Grades 1-3. Published online DOI: 10.5604/01.3001.0012.5915

NECTA (2020). Standard Two National Assessment 2019: Report on Reading, Arithmetic and Writing Assessment. NECTA, Dar es Salaam.

Nunes, T., Bryant, P., Barros, R., and Sylva, K. (2012). The relative importance of two different mathematical abilities to mathematical achievement. *Br. J. Educ. Psychol.* 82, 136–156. doi: 10.1111/j.2044-8279.2011.02033.x

Pinto, G., Bigozzi, L., Gamannossi, B. A. and Vezzani C. (2012). Emergent literacy and Early Writing skills. 173:3, 330 – 354.

Shoham, A., Shoham, S. and Mahil, M. (2011). Society's Level of literacy: a Cross/Cultural Study. *Issues in Science and Information Technology. (8) 2011.*

Siegler, R. S., Duncan G. J., Davis-Kean P. E., Duckworth K., Claessens A., Engel M., Susperreguy M. I. and Chen M, (2012). Early Predictors of High School Mathematics Achievement. Doi 10.1177/0956797612440101.

Tanzania Institute of Education. (2015) Primary Education Curriculum for Standard I – VII. Dar es Salaam, Ministry of Education Science and Technology.

UNICEF (2007) United Nations International Children's Education Fund.

URT (2021). Five Year Development Plan 2021/22 – 2025/26. URT, Dodoma.

Appendix 1: Regional Performance on the Oral Reading Fluency

REGION	OVERALL		BOYS		GIRLS	
	Mean Scores (%)	CWPM Equivalence	Mean Scores (%)	CWPM Equivalence	Mean Scores (%)	CWPM Equivalence
ARUSHA	66.23	33	60.74	30	71.70	36
DAR ES SALAAM	73.54	37	68.66	34	78.29	39
DODOMA	59.99	30	54.15	27	65.46	33
IRINGA	64.67	32	57.16	29	71.40	36
KAGERA	62.72	31	58.37	29	66.67	33
KIGOMA	42.43	21	38.90	19	45.90	23
KILIMANJARO	63.95	32	58.84	29	68.96	34
LINDI	47.45	24	44.04	22	50.79	25
MARA	52.37	26	47.61	24	56.44	28
MBEYA	59.41	30	54.21	27	64.69	32
MOROGORO	55.84	28	53.20	27	58.25	29
MTWARA	49.21	25	44.97	22	53.76	27
MWANZA	54.35	27	52.14	26	56.44	28
PWANI	52.85	26	48.38	24	57.12	29
RUKWA	37.75	19	34.45	17	40.92	20
RUVUMA	49.73	25	45.41	23	53.24	27
SHINYANGA	42.66	21	38.77	19	46.49	23
SINGIDA	44.86	22	41.44	21	48.50	24
TABORA	52.88	26	50.00	25	55.44	28
TANGA	64.10	32	58.48	29	69.65	35
MANYARA	54.95	27	49.51	25	60.88	30
GEITA	57.46	29	55.57	28	59.40	30
KATAVI	32.47	16	32.14	16	32.75	16
NJOMBE	58.30	29	50.48	25	64.91	32
SIMIYU	44.38	22	39.29	20	49.14	25
SONGWE	53.18	27	47.80	24	57.99	29
NATIONAL MEAN SCORE	54.98	27	50.86	25	58.91	29

Appendix 2: Regional Performance on the Reading Comprehension

REGION	OVERALL		BOYS		GIRLS	
	Mean Scores (%)	Comprehended Items Equivalence	Mean Scores (%)	Comprehended Items Equivalence	Mean Scores (%)	Comprehended Items Equivalence
ARUSHA	53.48	3	49.86	2	57.09	3
DAR ES SALAAM	65.92	3	62.51	3	69.25	3
DODOMA	49.15	2	43.74	2	54.24	3
IRINGA	58.52	3	52.12	3	64.25	3
KAGERA	50.97	3	49.78	2	52.05	3
KIGOMA	34.07	2	30.26	2	37.81	2
KILIMANJARO	58.23	3	53.51	3	62.86	3
LINDI	54.67	3	51.03	3	58.23	3
MARA	42.62	2	38.39	2	46.26	2
MBEYA	50.00	3	46.66	2	53.38	3
MOROGORO	54.31	3	52.35	3	56.10	3
MTWARA	51.08	3	46.42	2	56.09	3
MWANZA	44.43	2	44.23	2	44.63	2
PWANI	53.40	3	49.86	2	56.79	3
RUKWA	32.77	2	29.28	1	36.14	2
RUVUMA	47.00	2	43.09	2	50.17	3
SHINYANGA	36.62	2	33.26	2	39.93	2
SINGIDA	41.79	2	38.59	2	45.21	2
TABORA	47.54	2	46.29	2	48.64	2
TANGA	53.06	3	49.83	2	56.23	3
MANYARA	47.83	2	41.91	2	54.28	3
GEITA	44.98	2	44.29	2	45.69	2
KATAVI	32.37	2	33.32	2	31.52	2
NJOMBE	59.19	3	53.50	3	64.00	3
SIMIYU	30.23	2	27.81	1	32.49	2
SONGWE	48.85	2	45.94	2	51.45	3

Appendix 3: Ranking of Regions per Mean Percentage Scores on ORF and ORC

REGION	RANKING OF REGIONS PER MEAN PERCENTAGE SCORES ON READING SUBSTASKS (ORF & ORC)		
	Overall	Gender of Pupils	
		Boys	Girls
DAR ES SALAAM	1	1	1
IRINGA	2	4	2
KILIMANJARO	3	2	3
ARUSHA	4	3	5
NJOMBE	5	8	4
TANGA	6	5	6
KAGERA	7	6	8
MOROGORO	8	7	11
MBEYA	9	9	9
DODOMA	10	12	7
PWANI	11	11	12
MANYARA	12	17	10
GEITA	13	10	16
LINDI	14	15	15
SONGWE	15	16	14
TABORA	16	14	17
MTWARA	17	18	13
MWANZA	18	13	20
RUVUMA	19	19	18
MARA	20	20	19
SINGIDA	21	21	21
SHINYANGA	22	22	22
KIGOMA	23	23	23
SIMIYU	24	24	24
RUKWA	25	26	25
KATAVI	26	25	26

Appendix 4: Trends in Regional Performance between 2019-2021 on Pupils who met Benchmark on the ORF and ORC.

REGION	ORAL READING FLUENCY			ORAL READING COMPREHENSION		
	2019	2021	% Change in ORF	2019	2021	% Change in ORC
ARUSHA	21.6%	30.7%	9.1%	35.1%	45.8%	10.7%
DAR ES SALAAM	29.4%	37.3%	7.9%	62.8%	63.0%	0.2%
DODOMA	22.9%	15.1%	-7.8%	47.8%	40.7%	-7.1%
IRINGA	26.7%	19.8%	-6.9%	45.2%	50.6%	5.4%
KAGERA	14.5%	18.9%	4.4%	26.2%	43.8%	17.6%
KIGOMA	13.6%	9.9%	-3.7%	27.1%	26.8%	-0.3%
KILIMANJARO	26.9%	26.4%	-0.5%	42.8%	44.9%	2.1%
LINDI	13.3%	17.8%	4.5%	49.9%	51.8%	1.9%
MARA	20.0%	17.7%	-2.3%	30.9%	34.0%	3.1%
MBEYA	15.3%	18.2%	2.9%	36.1%	41.9%	5.8%
MOROGORO	29.0%	13.8%	-15.2%	62.8%	50.7%	-12.1%
MTWARA	13.8%	17.2%	3.4%	42.8%	47.4%	4.6%
MWANZA	12.0%	16.3%	4.3%	28.0%	38.7%	10.7%
PWANI	17.5%	18.4%	0.9%	53.5%	51.0%	-2.5%
RUKWA	11.6%	5.7%	-5.9%	25.3%	22.5%	-2.8%
RUVUMA	18.9%	15.2%	-3.7%	43.4%	41.4%	-2.0%
SHINYANGA	14.4%	13.5%	-0.9%	28.8%	29.5%	0.7%
SINGIDA	20.1%	11.8%	-8.3%	36.7%	34.4%	-2.3%
TABORA	10.9%	17.2%	6.3%	36.4%	43.0%	6.6%
TANGA	28.3%	24.9%	-3.4%	51.9%	47.0%	-4.9%
MANYARA	25.8%	22.6%	-3.2%	33.9%	41.9%	8.0%
GEITA	15.8%	16.1%	0.3%	31.0%	40.1%	9.1%
KATAVI	7.3%	4.9%	-2.4%	25.4%	23.9%	-1.5%
NJOMBE	19.6%	22.6%	3.0%	43.0%	49.3%	6.3%
SIMIYU	21.4%	9.6%	-11.8%	30.7%	20.7%	-10.0%
SONGWE	18.2%	16.4%	-1.8%	32.2%	41.3%	9.1%

Appendix 5: Trends in Regional Performance between 2019-2021 on Pupils Scoring *Zeros on ORF and ORC*

REGION	ORAL READING FLUENCY			ORAL READING COMPREHENSION		
	2019	2021	% Change in ORF	2019	2021	% Change in ORC
ARUSHA	13.0%	9.1%	-3.9%	26.6%	15.3%	-11.3%
DAR ES SALAAM	4.0%	3.4%	-0.6%	7.5%	6.7%	-0.8%
DODOMA	10.1%	9.3%	-0.8%	15.4%	14.2%	-1.2%
IRINGA	5.0%	6.2%	1.2%	11.6%	11.1%	-0.5%
KAGERA	11.8%	5.3%	-6.5%	26.7%	10.6%	-16.1%
KIGOMA	27.8%	27.1%	-0.7%	36.8%	37.2%	0.4%
KILIMANJARO	9.0%	6.8%	-2.2%	13.8%	12.3%	-1.5%
LINDI	18.7%	23.5%	4.8%	23.2%	29.4%	6.2%
MARA	20.5%	18.2%	-2.3%	29.0%	25.5%	-3.5%
MBEYA	14.9%	11.6%	-3.3%	20.9%	18.8%	-2.1%
MOROGORO	7.9%	15.1%	7.2%	10.3%	18.5%	8.2%
MTWARA	16.8%	22.6%	5.8%	20.9%	28.7%	7.8%
MWANZA	19.9%	18.8%	-1.1%	30.2%	24.4%	-5.8%
PWANI	12.6%	16.4%	3.8%	18.4%	22.3%	3.9%
RUKWA	23.1%	31.2%	8.1%	31.5%	39.3%	7.8%
RUVUMA	13.6%	21.4%	7.8%	17.1%	28.4%	11.3%
SHINYANGA	21.6%	25.9%	4.3%	30.9%	35.3%	4.4%
SINGIDA	13.3%	28.5%	15.2%	20.3%	32.3%	12.0%
TABORA	17.1%	10.1%	-7.0%	26.4%	21.7%	-4.7%
TANGA	12.1%	3.9%	-8.2%	16.5%	16.6%	0.1%
MANYARA	14.7%	15.8%	1.1%	25.7%	24.3%	-1.4%
GEITA	22.6%	3.6%	-19.0%	31.1%	22.3%	-8.8%
KATAVI	23.5%	29.7%	6.2%	33.5%	42.2%	8.7%
NJOMBE	7.8%	11.4%	3.6%	13.0%	15.7%	2.7%
SIMIYU	19.9%	17.9%	-2.0%	29.3%	36.8%	7.5%
SONGWE	21.1%	15.2%	-5.9%	31.7%	24.2%	-7.5%

Appendix 6: Oral Reading Fluency Percentage change between 2019 and 2021

WORDS	2019	2021	% CHANGE	WORDS	2019	2021	% CHANGE
Tina	77.7%	78.0%	0.3%	Subira	46.9%	49.3%	2.4%
na	81.9%	83.9%	2.0%	alichukua	54.4%	54.0%	-0.4%
Subira	57.3%	57.2%	0.0%	kata	54.3%	60.8%	6.5%
ni	81.1%	82.8%	1.8%	na	53.6%	61.3%	7.8%
marafiki	66.6%	63.6%	-3.0%	kujaza	51.0%	58.0%	7.1%
Wanaishi	73.0%	69.7%	-3.3%	ndoo	50.1%	56.8%	6.7%
kijiji	74.6%	75.1%	0.5%	yake	49.4%	59.1%	9.7%
cha	79.2%	79.2%	0.0%	Mara	39.0%	48.9%	9.9%
Ng'alo	31.3%	31.6%	0.3%	akaanza	44.2%	51.9%	7.7%
Kijiji	75.4%	72.9%	-2.5%	kupiga	42.6%	54.6%	11.9%
chao	73.8%	71.2%	-2.6%	kelele	40.1%	48.7%	8.6%
kina	77.3%	72.9%	-4.4%	kumbe	37.7%	49.0%	11.4%
shida	63.3%	63.5%	0.3%	alikuwa	36.9%	47.9%	11.0%
kubwa	64.2%	59.9%	-4.3%	amechomwa	33.3%	37.3%	4.0%
ya	74.7%	71.0%	-3.7%	na	34.3%	47.0%	12.7%
maji	74.9%	69.9%	-5.0%	mwiba	32.7%	40.3%	7.6%
Siku	73.2%	67.6%	-5.7%	Hatimaye	28.0%	34.4%	6.4%
moja	73.4%	68.1%	-5.3%	Subira	23.2%	30.0%	6.8%
Tina	70.2%	66.4%	-3.8%	alishindwa	24.7%	27.4%	2.7%
na	71.3%	67.9%	-3.4%	kubeba	24.1%	32.7%	8.6%
Subira	51.7%	51.3%	-0.4%	ndoo	23.6%	30.4%	6.8%
walikwenda	61.9%	53.2%	-8.7%	Wazazi	21.2%	29.6%	8.4%
kisimani	63.9%	61.7%	-2.2%	wake	20.6%	28.9%	8.2%
kuteka	61.4%	62.6%	1.3%	walimpeleka	18.6%	22.6%	4.0%
maji	63.6%	64.6%	1.0%	hospitali	16.4%	22.1%	5.7%

Appendix 7: Regional Performance on the Addition and Subtraction Subtask

REGION	OVERALL		BOYS		GIRLS	
	Mean Scores (%)	Items got right Equivalence	Mean Scores (%)	Items got right Equivalence	Mean Scores (%)	Items got right Equivalence
ARUSHA	52.63	5	53.96	5	51.32	5
DAR ES SALAAM	62.76	6	59.56	6	65.87	7
DODOMA	46.39	5	45.73	5	47.00	5
IRINGA	52.76	5	51.01	5	54.32	5
KAGERA	52.54	5	52.91	5	52.21	5
KIGOMA	32.36	3	32.44	3	32.28	3
KILIMANJARO	55.55	6	53.08	5	58.00	6
LINDI	50.27	5	52.28	5	48.33	5
MARA	44.90	4	44.67	4	45.10	5
MBEYA	48.49	5	46.47	5	50.55	5
MOROGORO	52.50	5	50.83	5	54.00	5
MTWARA	49.27	5	48.86	5	49.69	5
MWANZA	50.14	5	51.08	5	49.28	5
PWANI	46.71	5	45.76	5	47.59	5
RUKWA	28.30	3	28.32	3	28.28	3
RUVUMA	32.62	3	33.85	3	31.67	3
SHINYANGA	34.12	3	35.90	4	32.40	3
SINGIDA	34.55	3	35.08	4	34.00	3
TABORA	31.87	3	33.10	3	30.82	3
TANGA	34.55	3	33.93	3	35.16	4
MANYARA	42.68	4	43.36	4	41.95	4
GEITA	34.42	3	34.23	3	34.61	3
KATAVI	34.48	3	37.09	4	32.18	3
NJOMBE	47.44	5	43.31	4	50.90	5
SIMIYU	27.96	3	28.27	3	27.67	3
SONGWE	28.83	3	29.94	3	27.85	3
NATIONAL MEAN SCORE	43.31	4	43.13	4	43.48	4

Appendix 8: Regional Performance on the Missing Number Subtask

REGION	OVERALL		BOYS		GIRLS	
	Mean Scores (%)	Items got right Equivalence	Mean Scores (%)	Items got right Equivalence	Mean Scores (%)	Items got right Equivalence
ARUSHA	34.17	2	34.69	2	33.67	2
DAR ES SALAAM	44.52	2	46.32	2	42.78	2
DODOMA	22.84	1	24.29	1	21.49	1
IRINGA	25.47	1	25.53	1	25.42	1
KAGERA	34.62	2	37.96	2	31.53	2
KIGOMA	12.17	1	12.48	1	11.87	1
KILIMANJARO	37.63	2	34.93	2	40.32	2
LINDI	29.17	1	30.87	2	27.52	1
MARA	15.70	1	17.61	1	14.07	1
MBEYA	29.41	1	26.86	1	32.01	2
MOROGORO	33.38	2	31.87	2	34.72	2
MTWARA	36.70	2	35.31	2	38.14	2
MWANZA	28.91	1	29.50	1	28.36	1
PWANI	31.03	2	29.11	1	32.80	2
RUKWA	18.64	1	17.46	1	19.76	1
RUVUMA	35.99	2	41.01	2	32.14	2
SHINYANGA	24.74	1	23.35	1	26.07	1
SINGIDA	19.95	1	21.93	1	17.85	1
TABORA	30.15	2	30.56	2	29.79	1
TANGA	32.92	2	33.75	2	32.09	2
MANYARA	39.68	2	41.65	2	37.55	2
GEITA	22.02	1	23.91	1	20.08	1
KATAVI	24.72	1	28.23	1	21.63	1
NJOMBE	41.06	2	37.73	2	43.87	2
SIMIYU	20.08	1	17.71	1	22.31	1
SONGWE	22.25	1	22.16	1	22.33	1
NATIONAL MEAN SCORE	28.75	1	29.28	1	28.25	1

Appendix 9: Regional Performance on the Word Problems Subtask

REGION	OVERALL		BOYS		GIRLS	
	Mean Scores (%)	Items got right Equivalence	Mean Scores (%)	Items got right Equivalence	Mean Scores (%)	Items got right Equivalence
ARUSHA	47.25	2	47.86	2	46.66	2
DAR ES SALAAM	60.37	3	58.89	3	61.80	3
DODOMA	39.30	2	37.40	2	41.06	2
IRINGA	46.19	2	43.36	2	48.73	2
KAGERA	46.40	2	47.09	2	45.76	2
KIGOMA	22.56	1	19.93	1	25.13	1
KILIMANJARO	53.08	3	49.66	2	56.49	3
LINDI	45.27	2	47.45	2	43.17	2
MARA	33.55	2	31.81	2	35.04	2
MBEYA	41.74	2	40.64	2	42.85	2
MOROGORO	42.85	2	40.05	2	45.33	2
MTWARA	44.83	2	44.31	2	45.39	2
MWANZA	39.34	2	39.98	2	38.76	2
PWANI	41.97	2	38.66	2	45.03	2
RUKWA	27.65	1	26.61	1	28.64	1
RUVUMA	40.27	2	43.74	2	37.62	2
SHINYANGA	30.41	2	28.37	1	32.37	2
SINGIDA	32.42	2	33.14	2	31.67	2
TABORA	42.88	2	45.29	2	40.82	2
TANGA	43.17	2	41.27	2	45.04	2
MANYARA	46.21	2	44.59	2	47.98	2
GEITA	35.54	2	34.71	2	36.39	2
KATAVI	32.38	2	35.88	2	29.30	1
NJOMBE	56.23	3	53.22	3	58.75	3
SIMIYU	29.42	1	26.81	1	31.87	2
SONGWE	35.40	2	32.86	2	37.66	2
NATIONAL MEAN SCORE	40.66	2	39.75	2	41.51	2

Appendix 10: Ranking of Regions per Mean Percentage Scores on Addition and Subtraction, *Missing Numbers and Word Problems Subtasks*

REGION	RANKING OF REGIONS PER MEAN PERCENTAGE SCORES ON ARITHMETIC SUBTASKS		
	Overall	Gender of Pupils	
		Boys	Girls
DAR ES SALAAM	1	1	1
KILIMANJARO	2	3	2
NJOMBE	3	5	3
ARUSHA	4	4	6
KAGERA	5	2	7
MTWARA	6	8	5
MOROGORO	7	9	4
MANYARA	8	7	9
LINDI	9	6	12
IRINGA	10	11	8
PWANI	11	14	10
MBEYA	12	13	11
MWANZA	13	10	13
TANGA	14	15	14
RUVUMA	15	12	16
DODOMA	16	17	15
TABORA	17	16	16
MARA	18	19	18
GEITA	19	20	19
KATAVI	20	18	23
SHINYANGA	21	22	20
SINGIDA	22	21	22
SONGWE	23	23	21
SIMIYU	24	24	24
RUKWA	25	25	25
KIGOMA	26	26	26

Appendix 11: Trends in Regional Performance between 2019-2021 on Pupils who *met Benchmark on Addition and Subtraction and Missing Number Subtasks*

REGION	ADDITION AND SUBTRACTION			MISSING NUMBERS		
	2019	2021	% Change	2019	2021	% Change
ARUSHA	18.1%	30.6%	12.5%	47.1%	29.4%	-17.7%
DAR ES SALAAM	25.3%	43.4%	18.1%	48.8%	36.9%	-11.9%
DODOMA	27.2%	19.6%	-7.6%	41.2%	13.9%	-27.3%
IRINGA	12.1%	29.0%	16.9%	33.6%	16.9%	-16.7%
KAGERA	20.2%	29.3%	9.1%	40.9%	30.2%	-10.7%
KIGOMA	11.9%	10.2%	-1.7%	26.8%	6.7%	-20.1%
KILIMANJARO	20.6%	32.6%	12.0%	34.3%	28.6%	-5.7%
LINDI	20.0%	25.3%	5.3%	30.3%	22.7%	-7.6%
MARA	11.8%	20.4%	8.6%	27.5%	9.4%	-18.1%
MBEYA	13.9%	22.5%	8.6%	35.9%	21.4%	-14.5%
MOROGORO	26.0%	26.5%	0.5%	56.5%	27.0%	-29.5%
MTWARA	6.2%	23.8%	17.6%	35.9%	29.8%	-6.1%
MWANZA	12.9%	29.9%	17.0%	29.1%	24.4%	-4.7%
PWANI	22.6%	14.2%	-8.4%	41.8%	25.6%	-16.2%
RUKWA	5.1%	5.5%	0.4%	29.0%	13.8%	-15.2%
RUVUMA	14.1%	6.8%	-7.3%	56.5%	33.5%	-23.0%
SHINYANGA	15.2%	13.8%	-1.4%	10.0%	19.3%	9.3%
SINGIDA	18.1%	10.2%	-7.9%	34.5%	13.1%	-21.4%
TABORA	11.5%	11.8%	0.3%	40.6%	24.8%	-15.8%
TANGA	18.6%	7.6%	-11.0%	38.9%	24.2%	-14.7%
MANYARA	16.1%	19.8%	3.7%	44.2%	35.4%	-8.8%
GEITA	14.5%	9.5%	-5.0%	40.4%	16.5%	-23.9%
KATAVI	15.5%	10.0%	-5.5%	31.4%	22.4%	-9.0%
NJOMBE	19.8%	21.2%	1.4%	39.7%	36.3%	-3.4%
SIMIYU	20.2%	8.4%	-11.8%	45.8%	14.2%	-31.6%
SONGWE	16.0%	7.0%	-9.0%	31.0%	16.9%	-14.1%

***Appendix 12: Trends in Regional Performance between 2019-2021 on* Pupils Scoring Zeros on Addition and Subtraction and Missing Number Subtasks**

REGION	ADDITION AND SUBTRACTION LEVEL II			MISSING NUMBERS		
	2019	2021	% Change	2019	2021	% Change
ARUSHA	26.2%	12.8%	-13.4%	15.6%	31.4%	15.8%
DAR ES SALAAM	9.5%	4.7%	-4.8%	9.2%	14.4%	5.2%
DODOMA	10.4%	13.1%	2.7%	17.2%	44.6%	27.4%
IRINGA	20.2%	11.7%	-8.5%	20.5%	39.6%	19.1%
KAGERA	21.5%	10.1%	-11.4%	20.8%	33.4%	12.6%
KIGOMA	37.7%	27.6%	-10.1%	37.7%	67.4%	29.7%
KILIMANJARO	17.1%	6.7%	-10.4%	14.5%	17.7%	3.2%
LINDI	24.0%	14.5%	-9.5%	27.2%	37.9%	10.7%
MARA	31.2%	19.3%	-11.9%	33.8%	58.7%	24.9%
MBEYA	19.4%	12.5%	-6.9%	27.2%	37.1%	9.9%
MOROGORO	10.2%	11.0%	0.8%	8.6%	32.1%	23.5%
MTWARA	25.5%	14.3%	-11.2%	24.3%	27.1%	2.8%
MWANZA	26.2%	16.2%	-10.0%	31.1%	43.2%	12.1%
PWANI	14.6%	11.0%	-3.6%	23.1%	35.1%	12.0%
RUKWA	42.8%	28.8%	-14.0%	35.6%	59.2%	23.6%
RUVUMA	15.3%	19.1%	3.8%	14.2%	33.4%	19.2%
SHINYANGA	23.8%	23.7%	-0.1%	30.7%	50.2%	19.5%
SINGIDA	20.3%	19.0%	-1.3%	25.9%	53.4%	27.5%
TABORA	30.4%	24.9%	-5.5%	25.1%	41.9%	16.8%
TANGA	18.9%	13.8%	-5.1%	18.0%	31.3%	13.3%
MANYARA	28.3%	17.8%	-10.5%	23.3%	29.9%	6.6%
GEITA	27.2%	17.8%	-9.4%	28.4%	53.7%	25.3%
KATAVI	29.4%	21.2%	-8.2%	34.3%	53.2%	18.9%
NJOMBE	19.1%	10.1%	-9.0%	21.2%	25.1%	3.9%
SIMIYU	27.5%	30.1%	2.6%	33.9%	55.0%	21.1%
SONGWE	27.8%	19.3%	-8.5%	35.9%	51.5%	15.6%

Appendix 13: Regional Performance on the Writing Words Subtask

REGION	OVERALL		BOYS		GIRLS	
	Mean Scores (%)	Names of Pictures Written Correctly	Mean Scores (%)	Names of Pictures Written Correctly	Mean Scores (%)	Names of Pictures Written Correctly
ARUSHA	66.06	7	62.84	6	69.26	7
DAR ES SALAAM	77.97	8	74.97	8	80.48	8
DODOMA	61.05	6	58.33	6	63.61	6
IRINGA	68.94	7	65.15	7	72.33	7
KAGERA	48.19	5	45.90	5	50.27	5
KIGOMA	47.44	5	43.42	4	51.39	5
KILIMANJARO	68.65	7	64.69	6	72.57	7
LINDI	57.46	6	55.61	6	59.26	6
MARA	43.45	4	40.72	4	45.66	5
MBEYA	56.50	6	52.94	5	60.14	6
MOROGORO	53.88	5	50.44	5	57.00	6
MTWARA	54.49	5	53.28	5	55.79	6
MWANZA	53.25	5	51.63	5	54.76	5
PWANI	49.64	5	46.30	5	52.80	5
RUKWA	33.70	3	32.00	3	35.31	4
RUVUMA	46.23	5	44.50	4	47.59	5
SHINYANGA	31.57	3	29.15	3	33.91	3
SINGIDA	42.05	4	38.73	4	45.51	5
TABORA	40.96	4	39.30	4	42.39	4
TANGA	58.50	6	54.36	5	62.64	6
MANYARA	55.21	6	50.94	5	59.87	6
GEITA	42.33	4	39.95	4	44.85	4
KATAVI	36.83	4	37.99	4	35.83	4
NJOMBE	62.06	6	55.93	6	67.28	7
SIMIYU	30.22	3	27.26	3	32.98	3
SONGWE	47.41	5	43.68	4	50.80	5
NATIONAL MEAN SCORE	51.99	5	49.10	5	54.70	5

Appendix 14: Regional Performance on Transforming Small Letters into Capital Letters Subtask

REGION	OVERALL		BOYS		GIRLS	
	Mean Scores (%)	Words Written in Capital Letters Correctly	Mean Scores (%)	Words Written in Capital Letters Correctly	Mean Scores (%)	Words Written in Capital Letters Correctly
ARUSHA	32.74	3	32.07	3	33.40	3
DAR ES SALAAM	59.86	6	55.65	6	63.36	6
DODOMA	24.68	2	21.41	2	27.76	3
IRINGA	40.27	4	35.75	4	44.30	4
KAGERA	29.69	3	29.85	3	29.53	3
KIGOMA	13.65	1	10.72	1	16.52	2
KILIMANJARO	49.42	5	40.77	4	57.99	6
LINDI	31.68	3	29.97	3	33.36	3
MARA	11.63	1	9.79	1	13.12	1
MBEYA	30.10	3	27.55	3	32.71	3
MOROGORO	21.49	2	17.71	2	24.90	2
MTWARA	36.33	4	33.86	3	38.97	4
MWANZA	25.16	3	26.01	3	24.36	2
PWANI	27.53	3	22.86	2	31.94	3
RUKWA	17.89	2	17.59	2	18.17	2
RUVUMA	24.35	2	25.76	3	23.24	2
SHINYANGA	21.66	2	20.72	2	22.58	2
SINGIDA	16.54	2	14.46	1	18.72	2
TABORA	28.86	3	28.94	3	28.79	3
TANGA	26.92	3	23.26	2	30.57	3
MANYARA	34.90	3	32.47	3	37.54	4
GEITA	19.11	2	18.29	2	19.97	2
KATAVI	14.96	2	15.78	2	14.24	1
NJOMBE	41.45	4	33.78	3	47.97	5
SIMIYU	16.71	2	16.00	2	17.37	2
SONGWE	27.41	3	23.09	2	31.33	3
NATIONAL MEAN SCORE	28.26	3	26.03	3	30.35	3

Appendix 15: Regional Performance on Copying Words and Using Punctuation Marks Appropriately Subtask

REGION	OVERALL			BOYS			GIRLS		
	Mean Scores (%)	Punctuation Marks used Appropriately	Words Copied Correctly from the passage	Mean Scores (%)	Punctuation Marks used Appropriately	Words Copied Correctly from the passage	Mean Scores (%)	Punctuation Marks used Appropriately	Words Copied Correctly from the passage
ARUSHA	37.18	1	7	35.17	1	7	39.17	1	7
DAR ES SALAAM	57.55	1	10	55.22	1	10	59.49	1	11
DODOMA	24.93	0	5	20.44	0	4	29.16	0	6
IRINGA	48.59	0	9	43.06	0	8	53.52	1	10
KAGERA	37.50	0	7	35.15	0	7	39.61	0	8
KIGOMA	12.07	0	2	10.78	0	2	13.34	0	3
KILIMANJARO	48.45	1	9	44.17	1	8	52.68	1	10
LINDI	35.47	0	7	35.01	0	7	35.92	0	7
MARA	16.13	0	3	18.40	0	3	14.29	0	3
MBEYA	37.50	0	7	35.74	0	7	39.30	0	7
MOROGORO	36.17	0	7	32.99	0	6	39.06	1	7
MTWARA	42.45	1	8	40.39	0	8	44.65	1	8
MWANZA	27.24	0	5	27.42	0	5	27.08	0	5
PWANI	43.84	1	8	40.06	0	8	47.42	1	9

REGION	OVERALL			BOYS			GIRLS		
	Mean Scores (%)	Punctuation Marks used Appropriately	Words Copied Correctly from the passage	Mean Scores (%)	Punctuation Marks used Appropriately	Words Copied Correctly from the passage	Mean Scores (%)	Punctuation Marks used Appropriately	Words Copied Correctly from the passage
RUKWA	20.81	0	4	19.98	0	4	21.59	0	4
RUVUMA	33.39	0	6	33.29	0	6	33.47	0	6
SHINYANGA	28.05	0	5	24.01	0	5	31.98	0	6
SINGIDA	20.07	0	4	17.69	0	3	22.55	0	4
TABORA	35.71	0	7	33.15	1	6	37.93	0	7
TANGA	42.38	0	8	36.55	0	7	48.21	1	9
MANYARA	35.04	1	6	31.70	0	6	38.69	1	7
GEITA	16.88	0	3	15.05	0	3	18.82	0	4
KATAVI	16.03	0	3	14.74	0	3	17.16	0	3
NJOMBE	49.84	1	9	42.76	1	8	55.85	1	10
SIMIYU	21.70	0	4	17.24	0	3	25.88	0	5
SONGWE	21.78	0	4	18.18	0	4	25.05	0	5
NATIONAL MEAN SCORE	32.61	0	6	30.02	0	6	35.03	0	7

Appendix 16: Ranking of Regions per Mean Percentage Scores on Writing Words, Changing Small Letters into Capital Letters and Copying the Passage and Using Punctuation Marks Subtasks.

REGION	RANKING OF REGIONS PER MEAN PERCENTAGE SCORES ON WRITING SUBTASKS		
	Overall	Gender of Pupils	
		Boys	Girls
DAR ES SALAAM	1	1	1
KILIMANJARO	2	2	2
IRINGA	3	3	4
NJOMBE	4	4	3
ARUSHA	5	5	5
MTWARA	6	6	7
TANGA	7	10	6
MANYARA	8	9	8
LINDI	9	7	11
MBEYA	10	8	10
PWANI	11	12	9
KAGERA	12	11	14
MOROGORO	13	16	12
DODOMA	14	17	13
MWANZA	15	13	17
TABORA	16	15	15
RUVUMA	17	14	18
SONGWE	18	18	16
SHINYANGA	19	19	19
SINGIDA	20	21	20
GEITA	21	20	21
KIGOMA	22	25	22
RUKWA	23	22	24
MARA	24	23	25
SIMIYU	25	26	23
KATAVI	26	24	26

Appendix 17: Overall Regional Rank on the 2021 3Rs Study

REGION	2021 3Rs ASSESSMENT								OVERALL RANK
	REGIONAL RANKS FOR ALL 3Rs SUBTASKS								
	READING		ARITHMETIC			WRITING			
	Oral Reading Fluency (ORF)	Reading Comprehension (ORC)	Addition and Subtraction	Missing Numbers	Word Problems	Writing Words	Small Letters into Capital Letters	Copying Passage and Using Punctuation Marks	
DAR ES SALAAM	1	1	1	1	1	1	1	1	1
KILIMANJARO	5	4	2	4	3	3	2	4	2
NJOMBE	9	2	11	2	2	5	3	2	3
IRINGA	3	3	3	16	7	2	4	3	4
ARUSHA	2	7	4	8	4	4	7	10	5
MTWARA	19	10	9	5	9	11	5	6	6
KAGERA	6	11	5	7	5	15	10	8	7
MANYARA	12	15	15	3	6	10	6	14	8
TANGA	4	9	16	10	10	7	14	7	9
MBEYA	8	12	10	13	14	9	9	8	10
LINDI	20	5	7	14	8	8	8	13	11
MOROGORO	11	6	6	9	12	12	19	11	12
PWANI	16	8	12	11	13	14	12	5	13

REGION	2021 3Rs ASSESSMENT								OVERALL RANK
	REGIONAL RANKS FOR ALL 3Rs SUBTASKS								
	READING		ARITHMETIC			WRITING			
	Oral Reading Fluency (ORF)	Reading Comprehension (ORC)	Addition and Subtraction	Missing Numbers	Word Problems	Writing Words	Small Letters into Capital Letters	Copying Passage and Using Punctuation Marks	
DODOMA	7	13	13	19	17	6	16	18	14
MWANZA	13	19	8	15	16	13	15	17	15
TABORA	15	16	23	12	11	22	11	12	16
RUVUMA	18	17	21	6	15	18	17	15	17
SONGWE	14	14	24	20	19	17	13	19	18
GEITA	10	18	19	21	18	20	20	23	19
MARA	17	20	14	25	20	19	26	24	20
SINGIDA	21	21	16	23	21	21	23	22	21
SHINYANGA	23	22	20	17	23	25	18	16	22
KATAVI	26	25	18	18	22	23	24	25	23
SIMIYU	22	26	26	22	24	26	22	20	24
RUKWA	25	24	25	24	25	24	21	21	25
KIGOMA	24	23	22	26	26	16	25	26	26

Apendix 18: Oral Reading and Oral Arithmetic Assessment Tool

JAMHURI YA MUUNGANO WA TANZANIA
BARAZA LA MITIHANI LA TANZANIA
UPIMAJI WA KITAIFA WA DARASA LA PILI

STADI YA KUSOMA NA KUHESABU

KARATASI YA MWANAFUNZI

Muda: Dakika 20 _____ Januari 2022 asubuhi

Maelekezo

1. Mwanafunzi anatakiwa kujibu maswali **yote kwa mdomo**.

2. Kila mwanafunzi atapimwa kwa **dakika 20**.

3. Msimamizi anatakiwa kujaza taarifa za mwanafunzi katika nafasi zilizo wazi juu ya fomu maalum ya upimaji kwa **kalamu ya wino wa bluu**.

4. Mwanafunzi atakapokuwa amemaliza kusoma na kujibu maswali ya ufahamu na kuhesabu, msimamizi anatakiwa kujaza alama katika skeli ya upimaji kwa kutumia **kalamu ya wino mwekundu**.

Ukurasa wa 1 kati ya 4

Tina na Subira ni marafiki. Wanaishi kijiji cha Ng'alo. Kijiji chao kina shida kubwa ya maji. Siku moja, Tina na Subira walikwenda kisimani kuteka maji. Subira alichukua kata na kujaza ndoo yake. Mara akaanza kupiga kelele, kumbe alikuwa amechomwa na mwiba. Hatimaye, Subira alishindwa kubeba ndoo. Wazazi wake walimpeleka hospitali.

1. 7 + 2 =

2. 14 + 5 =

3. 21 + 32 =

4. 39 + 52 =

5. 53 + 27 =

6. 8 - 3 =

7. 18 - 7 =

8. 46 - 32 =

9. 47 - 28 =

10. 60 - 32 =

Ukurasa wa 4 kati ya 4

Appendix 19: Oral Reading and Oral Arithmetic Rating Scale

JAMHURI YA MUUNGANO WA TANZANIA

BARAZA LA MITIHANI LA TANZANIA

Fomu Maalum ya Kujaza Alama za Mwanafunzi katika Upimaji wa Kusoma na Kuhesabu

Jina la Mwanafunzi_____

Namba ya Mwanafunzi_____

KWA MATUMIZI YA MPIMAJI TU					
STADI YA KUSOMA			STADI YA KUHESABU		
Namba ya Swali	Alama	Saini ya Mpimaji	Namba ya Swali	Alama	Saini ya Mpimaji
1.			1.		
			2.		
			3.		
			4.		
			5.		
2.			6.		
			7.		
			8.		
			9.		
			10.		
Jumla ya Alama					

Ukurasa wa 1 kati ya 9

SEHEMU A

1. Kusoma kifungu cha maneno kwa ufasaha, umakini na kasi inayotakiwa (alama 25).

Maelekezo kwa Msimamizi

Weka alama ya **mkwaju (/)** kwa kila neno ambalo mwanafunzi **ameshindwa** kulisoma kwenye kifungu cha maneno. Iwapo uliweka alama ya mkwaju mwanafunzi alipokosea kusoma neno na akarudia kusoma kwa usahihi, zungushia **(∅)** neno hilo. (Kila neno **moja** sahihi **alama 00½**)

(a) Mwelekeze mwanafunzi kusoma kifungu cha maneno kwa sauti, umakini na haraka kadri awezavyo. Mwanafunzi atakapokuwa anasoma, fuatilia usomaji wake kwa kutumia kifungu cha maneno kilichopo katika **Skeli ya Upimaji**.

(b) Iwapo mwanafunzi atashindwa kusoma neno baada ya **sekunde 3** mwelekeze kusoma neno linalofuata.

Ukurasa wa 2 kati ya 9

118

(c) Iwapo mwanafunzi atashindwa kusoma **maneno yote** ya sentensi ya kwanza, sitisha zoezi na weka alama ya mabano [ ] katika neno la mwisho kusomwa kisha endelea na stadi ya kuhesabu.

(d) Iwapo mwanafunzi atasema **sijui** wakati akisoma, chukulia kama ni **kosa** kisha weka alama ya mkwaju.

(e) Iwapo mwanafunzi atashindwa kumaliza kusoma kifungu cha maneno ndani ya **sekunde 60**, weka alama ya mabano [ ] katika neno la mwisho alilosoma.

Maelekezo ya Msimamizi kwa Mwanafunzi

Karibu ....·Hujambo?

(a) Hapa kuna kifungu cha maneno, nikisema anza utasoma (mwoneshe mwanafunzi kwa kugusa kwa kalamu kuanzia neno la kwanza kutoka kushoto kwenda kulia katika kila mstari).

(b) Utasoma maneno kwa sauti, umakini na haraka kadri uwezavyo.

(c) Weka kidole kwenye neno la kwanza. Je uko tayari? Anza.

Ukurasa wa 3 kati ya 9

Tina na Subira ni marafiki.

Wanaishi kijiji cha Ng'alo. Kijiji chao kina shida kubwa ya maji. Siku moja, Tina na Subira walikwenda kisimani kuteka maji. Subira alichukua kata na kujaza ndoo yake. Mara akaanza kupiga kelele, kumbe alikuwa amechomwa na mwiba. Hatimaye, Subira alishindwa kubeba ndoo. Wazazi wake walimpeleka hospitali.

Alama: ☐   Muda uliotumika: ☐

2· Kusoma kifungu cha maneno kisha kujibu maswali kwa mdomo (alama 25).

Maelekezo kwa Msimamizi

(a) Mwongoze mwanafunzi kusoma tena kifungu cha maneno (mwoneshe kwa kugusa kwa kalamu) kuanzia sentensi ya kwanza kutoka kushoto kwenda kulia katika kila mstari. Baada ya mwanafunzi kusoma ndani ya **dakika 3**, chukua karatasi ya mwanafunzi kisha muulize maswali yaliyopo kwenye **Skeli ya Upimaji**.

(b) Mwanafunzi akitoa jibu sahihi zungushia alama **5**, iwapo atatoa jibu lisilo sahihi zungushia alama **0**. Endapo mwanafunzi atatoa jibu lisilo sahihi na kisha kufanya marekebisho kwa kutoa jibu sahihi, weka mkwaju kwenye alama 0 kisha andika jumla ya alama katika nafasi kwenye jedwali.

(c) Iwapo utamuuliza swali mwanafunzi na akashindwa kujibu ndani ya **sekunde 10**, zungushia alama 0 kisha endelea na swali linalofuata.

Maelekezo ya Msimamizi kwa Mwanafunzi

(a) Utasoma tena kifungu cha maneno (mwoneshe mwanafunzi kwa kugusa kwa kalamu kuanzia sentensi ya kwanza kutoka kushoto kwenda kulia katika kila mstari).

(b) Utasoma maneno kwa sauti, umakini na haraka kadri uwezavyo· Baada ya kusoma nitachukua karatasi yako kisha

Ukurasa wa 5 kati ya 9

121

nitakuuliza maswali yanayotokana na kifungu cha maneno ulichosoma. Je uko tayari? Anza.

Tina na Subira ni marafiki.

Wanaishi kijiji cha Ng'alo. Kijiji chao kina shida kubwa ya maji. Siku moja, Tina na Subira walikwenda kisimani kuteka maji. Subira alichukua kata na kujaza ndoo yake. Mara akaanza kupiga kelele, kumbe alikuwa amechomwa na mwiba. Hatimaye, Subira alishindwa kubeba ndoo. Wazazi wake walimpeleka hospitali.

Maswali na Majibu

Kipengele	Maswali na majibu	Alama	
1.	Rafiki yake Tina anaitwa nani? (Subira)	5	0
2.	Tina na Subira wanaishi katika kijiji gani? (Ng'alo)	5	0
3.	Tina na Subira walikwenda wapi? (Kisimani)	5	0
4.	Subira alitumia nini kujaza maji	5	0

Ukurasa wa 6 kati ya 9

	kwenye ndoo yake? (Kata)		
5.	Kwanini Subira alipelekwa Hospitali? (Kwa sababu alikuwa amechomwa na mwiba/ kwa sababu alikuwa ameumia/ ili apate matibabu/ili apate dawa)	5	0
	Jumla ya Alama		

SEHEMU B

203   **STADI YA KUHESABU**

Maelekezo kwa Msimamizi

Zungushia alama **2** iwapo mwanafunzi atatoa jibu sahihi, zungushia alama **0** iwapo atatoa jibu lisilosahihi. Iwapo mwanafunzi atatoa jibu lisilosahihi na kisha kufanya marekebisho na kutoa jibu sahihi, weka mkwaju kwenye alama **0** kisha andika jumla ya alama katika nafasi kwenye jedwali.

(a) Mwongoze mwanafunzi kujibu maswali ya kujumlisha na kutoa. Mpe karatasi na penseli kisha mwambie kuwa anaweza kutumia kama anataka lakini sio lazima.

(b) Iwapo mwanafunzi atatumia njia isiyoridhisha muulize kama anaweza kutumia njia nyingine.

(c) Iwapo mwanafunzi ataendelea kutumia njia isiyoridhisha au atasimama/atakwama/hatajibu kwa **sekunde 5** endelea na swali linalofuata.

(d) Sitisha zoezi endapo mwanafunzi atakosa maswali **manne ya mwanzo** katika maswali ya kujumlisha endelea na maswali ya kutoa.

(e) Iwapo mwanafunzi atakosa maswali **manne ya mwanzo** katika maswali ya kutoa sitisha zoezi· Endelea na mwanafunzi anayefuata.

Maelekezo ya Msimamizi kwa Mwanafunzi

(a) Hapo kuna maswali ya kujumlisha na kutoa (mwoneshe mwanafunzi kwa mkono swali la 1 hadi la 5 kisha swali la 6 hadi 10).

(b) Utaanza na swali la 1. Utajibu maswali haya kwa mdomo. Unaweza kutumia penseli na karatasi kama unataka lakini sio lazima. Je upo tayari? Anza.

Na·	Maswali na majibu	Alama	
1·	7 + 2 = (9)	2	0
2·	14 + 5 = (19)	2	0
3·	21 + 32 = (53)	2	0
4·	39 + 52 = (91)	2	0
5·	53 + 27 = (80)	2	0

Ukurasa wa 8 kati ya 9

124

6.	8 - 3 = (5)	2	0
7.	18 - 7 = (11)	2	0
8.	46 - 32 = (14)	2	0
9.	47 - 28 = (19)	2	0
10.	60 - 32 = (28)	2	0
Jumla ya Alama			

Maoni ya msimamizi

Weka alama ya vema (√) iwapo mwanafunzi:

☐ ametumia vidole au kutali.

☐ ametumia karatasi na penseli.

☐ amejibu maswali yote kwa kichwa.

Jina la Mwanafunzi_____

Namba ya Mwanafunzi_____

JAMHURI YA MUUNGANO WA TANZANIA
BARAZA LA MITIHANI LA TANZANIA
UPIMAJI WA ELIMU YA MSINGI DARASA LA PILI

202   STADI YA KUANDIKA

Muda: Dakika 40   Januari 2022 asubuhi

Maelekezo

1· Karatasi hii ina **maswali matatu**.

2· Andika **Jina lako** na **Namba yako** katika kila ukurasa.

3· Jibu maswali **yote** matatu.

4· Andika **majibu yako yote** kwa kutumia penseli.
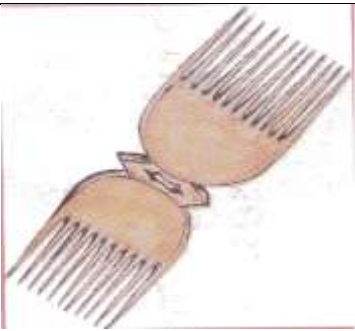
KWA MATUMIZI YA MPIMAJI TU		
Namba ya Swali	Alama	Saini ya Mpimaji
1·		
2·		
3·		
Jumla		

1. **Andika** majina ya **picha** hizi :

(a) _____	(b) _____
(c) _____	(d) _____

127

(e) _____	(f) _____
(g) _____	(h) _____

(i)		(j)	
	_____		_____

2. **Andika** *maneno yafuatayo kwa* **herufi kubwa** *katika nafasi iliyo wazi katika kila neno.*

(a) juisi   _____

(b) maji   _____

(c) asha   _____

(d) faida   _____

(e) gurudumu _____

(f) papai   _____

(g) zabibu   _____

(h) dodoma _____

(i) nanasi   _____

(j) mwanza _____

3. **Nakili** *kifungu cha maneno kifuatacho na kisha weka alama za uandishi yaani:* **nukta (.), mkato (,), alama ya kushangaa (!)** *na* **alama ya kuuliza (?)** *mahali panapostahili.*

Musa __ kwa nini wewe umemaliza chakula chote __ Oh __ Mimi sikubali nitakwenda kusema kwa mama na baba __

_____

_____

_____

_____

_____

_____

_____

Appendix 21: Arithmetic Skill Assessment Tool

Jina la Mwanafunzi_____

Namba ya Mwanafunzi _____

JAMHURI YA MUUNGANO WA TANZANIA
BARAZA LA MITIHANI LA TANZANIA
UPIMAJI WA KITAIFA WA DARASA LA PILI

203   STADI YA KUHESABU

<u>Muda: Dakika 50</u>   Januari 2022 asubuhi

Maelekezo

1. Karatasi hii ina maswali **kumi (10)**.

2. Jibu maswali **yote**.

3. Andika majibu yote kwa **penseli**.

KWA MATUMIZI YA MPIMAJI TU					
Namba ya Swali	Alama	Saini ya Mpimaji	Namba ya Swali	Alama	Saini ya Mpimaji
1.			6.		
2.			7.		
3.			8.		
4.			9.		
5.			10.		
Jumla ya Alama					

Ukurasa wa 1 ya kati 3

Andika namba inayokosekana katika nafasi iliyoachwa wazi katika swali la 1 hadi la 5.

1. 6, 5, 4, _____, 2, 1
2. 2, 5, 7, 9, _____
3. 14, 12, 10, 8, _____
4. 5, 10, 15, 20, _____, 30, 35.
5. 110, 111, _____, 113.

6. Kuku alitaga mayai 7. Ikiwa mayai 2 yalivunjika, je, yalibaki mayai mangapi?

   _____
   _____
   _____
   _____
   _____
   _____

7. James alikuwa na mbuzi 6. Aliongezewa mbuzi 2 na baba yake. Je, jumla ana mbuzi wangapi?

   _____
   _____
   _____
   _____
   _____
   _____

8. Juma alichuma maembe 30. Asha alichuma maembe 40. Jumla walichuma maembe mangapi?

   _____
   _____
   _____
   _____

_____

_____

_____

9. Asha alipewa pipi 44 na baba yake. Iwapo aliongezewa pipi 17 na dada yake, je, atakuwa na jumla ya pipi ngapi?

_____

_____

_____

_____

_____

_____

10. Kuku ana vifaranga 54. Vifaranga 26 vililiwa na mwewe. Je, alibakiwa na vifaranga vingapi?

_____

_____

_____

_____

_____

_____

Ukurasa wa 3 ya kati 3

Appendix 22: Questionnaire for the Head Teacher

<div align="center">

BARAZA LA MTIHANI LA TANZANIA
UPIMAJI WA STADI YA KUSOMA, KUANDIKA NA KUHESABU
HOJAJI LA MWALIMU MKUU

</div>

Jina la Shule: ………………………………………………………………………………….

Namba ya shule: …………………………………………………………………………………

Mkoa: …………………………………………

Wilaya: …………………………………………

A: Taarifa za shule kwa ujumla

Tafadhali jaza taarifa kuhusu wanafunzi na walimu wa KKK katika shule yako kwa kuandika katika visanduku/sehemu zilizoachwa wazi.

1. Je, uliwahi kuhudhuria mafunzo ya stadi za kusoma Kuandika na Kuhesabu?

   Ndiyo ☐   Hapana ☐

2. Kuna walimu wangapi wa darasa la 2 wanaofundisha shule hii? ☐

3. Je, kuna walimu wangapi wa darasa la pili waliopo shuleni leo? ☐

4. Je, kuna mikondo mingapi ya wanafunzi wa darasa la 2? ☐

5. Kuna wanafunzi wangapi wa darasa la pili walioandikishwa katika shule hii?

   Kati yao wavulana ni wangapi? ☐   na Wasichana ni wangapi? ☐

6. Je, Kuna wanafunzi wangapi waliohudhuria Shuleni leo? ☐

   Kati yao Wavulana ni Wangapi? ☐   na Wasichana ni wangapi? ☐

Je, kuna wanafunzi walioshindwa kufanya upimaji? Kama wapo waorodheshe.

Na.	Namba ya Mwanafunzi	Sababu Ya Kutofanya Upimaji

B: Taarifa kuhusu vifaa vya kufundishia na kujifunzia

Tafadhali jaza maoni yako kuhusu uwepo wa vifaa vya kufundishia na kujifunzia kwa kuweka alama ya vema (✓) kwenye uchaguzi unaolingana na maoni yako.

Na.	swali	Hafifu	Chini ya Wastani	Wastani Mzuri	Mzuri	Mzuri Sana
(i)	Upatikanaji wa vitabu vya kiada kufundishia stadi za kuhesabu shuleni kwako ni wa namna gani?					
(ii)	Upatikanaji wa vitabu vya ziada kwa ajili ya mazoezi ya stadi ya kuhesabu unaweza kuelezwa kuwa ni:					

Na.	swali	Hafifu	Chini ya Wastani	Wastani Mzuri	Mzuri	Mzuri Sana
(iii)	Uwepo wa vifaa vya kufundisha stadi ya kuhesabu (kama vile vihesabio na vifaa vingine unaweza kuelezwa kuwa ni:					
(iv)	Uwepo wa vifaa vya kufundishia stadi ya kuandika (kama vile vibao na vifaa vingine) unaweza kuelezwa kuwa ni:					
(v)	Je, uwepo wa vitabu vya kiada vya kufundishia stadi ya kusoma unaweza kuuelezeaje?					
(vi)	Je, unaweza kuelezeaje upatikanaji wa vifaa vinavyolenga kuendeleza stadi ya kusoma kama vile vitabu vya hadithi fupifupi kwa watoto wadogo?					

C: Taarifa kuhusu mazingira ya ufundishaji na ujifunzaji

Tafadhali jibu maswali kuhusu mazingira ya ufundishaji na ujifunzaji kwa kuweka alama ya vema (✓) kwenye kisanduku kulingana na uchaguzi wako kuhusu ufundishaji na ujifunzaji wa stadi za KKK katika shule yako.

Na.	Swali	Hafifu	Chini ya Wastani	Wastani	Mzuri	Mzuri Sana
(i)	Uwepo wa madawati, viti na meza za kukalia wanafunzi na walimu shuleni kwako wakati wa kujifunza unaweza kuelezwa kuwa ni;					
(ii)	Ikilinganishwa na idadi ya wanafunzi wa darasa la 2 waliopo shuleni kwa sasa, hali ya uwepo wa vyumba vya madarasa inaweza kuelezewa kuwa ni:					
(iii)	Je, upatikanaji wa vyanzo vya maji kwa ajili ya kunywa wanafunzi pamoja na usafi binafsi kama vile kunawa wanapotoka shuleni unaweza kuelezewa kuwa ni:					

D: Changamoto zinazojitokeza wakati wa ujifunzaji wa wanafunzi wa stadi za KKK

Tafadhali jibu maswali kuhusu changamoto zinazojitokeza ambazo zinafanya ujifunzaji wa wanafunzi wa stadi za KKK kuwa mgumu kwa kuweka alama ya vema (✓) katika changamoto inayojitokeza zaidi. (unaweza kuweka vema kwenye changamoto zaidi ya moja).

(i)   Umbali wa wanafunzi wengi kutoka shule ilipo

(ii)   Wanafunzi kukosa masomo mara kwa mara kutokana na mahudhurio yasiyoridhisha

(iii) Uhaba wa walimu ikilinganishwa na idadi ya wanafunzi

(iv) Kupokea wanafunzi wanaohamia ambao stadi zao za KKK

       haziridhishi

(v)   Uhaba wa vitendea kazi kama vile vitabu ikilinganishwa na idadi ya wanafunzi

(vi) Changamoto nyinginezo (Zitaje kama zipo) _____
_____
_____
_____
_____